PATENT
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Reissue Application of: BILL L. DAVIS and JESSE S. WILLIAMSON	§	
For Reissue of U. S. Patent 5,630,363 Issued May 20, 1997 Serial No. 08/515,097	§	Group Art Unit: 2854
Filing Date: May 20, 1999 (Reissue)	§	Examiner: _____
Serial No.: 09/315,796 (Reissue)	§	
For: COMBINED LITHOGRAPHIC/ FLEXOGRAPHIC PRINTING APPARATUS AND PROCESS	§	

DECLARATION OF JOHN W. BIRD

TO: The Honorable Commissioner of
Patents and Trademarks
Washington, D.C. 20231

SIR:

I, John W. Bird, declare on my oath the following:

1. I am over twenty-one (21) years of age, have never been convicted of a felony, and am competent to make this testimony. I am President of JB Machinery Incorporated, 9 Sasqua Trail, Weston, CT 06883. My *curriculum vitae* is attached hereto as Exhibit 1.

2. I have read U.S. Patent 5,630,363 to Davis and Williamson and am familiar with its specification, drawings, and claims. A copy of the '363 patent is attached hereto as Exhibit 2. I am aware that Davis and Williamson filed a reissue application seeking to make corrections in some of the claims of, and also seeking to add new claims to, the '363 patent, specifically claims 42-87. A copy of what I understand to be the reissue claims, which I have read, is attached as Exhibit 3.

3. For the reasons that follow, and in view of my personal knowledge of the events which occurred at Printing Research, Inc. ("PRI") and Williamson Printing Corporation ("WPC") between 1991 and 1995, I believe that Bill Davis and Jesse Williamson are the first, true and correct inventors of the claimed invention of the '363 patent, as well as the subject matter of their reissue claims. Furthermore, based on my more than 35 years of experience in the printing industry, I believe that the printing methods and presses claimed in the '363 patent, as well as in the reissue claims, were a significant advance in the mid-1990s.

4. I am aware that, on or about May 20, 1999, Plaintiffs Howard W. DeMoore and PRI filed a lawsuit in the Northern District of Texas styled *Printing Research, Inc. v. Williamson Printing Corporation, Bill L. Davis and Jesse S. Williamson*, Civil Action No. 3:99CV1154-D (Exhibit 4). In paragraph 10 of Plaintiff's Original Complaint, it is alleged that Howard W. DeMoore is the sole inventor of the claimed invention of the '363 patent, and that DeMoore himself conceived and developed a single-pass printing process "for selectively applying printing inks and coatings to paper and other substrates, in which one of the stations utilizes a flexographic process and at least one of the successive stations utilizes a lithographic process." These allegations are each false. Based upon my personal experience obtained while working at PRI, these allegations as well as similar allegations in the Complaint are false; Howard W. DeMoore did not conceive or reduce to practice the process invention broadly characterized as combining a flexographic step with downstream offset lithography. That simply did not happen in 1994 or 1995 or before.

5. To the best of my knowledge, there are no 1991-1995 conception memoranda, invention memoranda, notes, e-mails or memoranda of a conception of the use of a flexographic station prior to offset lithography authored by DeMoore, me or Rendleman or anyone else at PRI.

6. I was employed by PRI from early 1991 until early January 1997 when I was terminated as an employee. I was exclusively retained as a manufacture's representative for flexographic and converting products in June 1997. I was terminated still again as a sales agent in March 1998, and recently I settled a lawsuit with PRI who sued me and my new company (JB

Machinery) for alleged trade dress infringement and copyright infringement over my company's new brochures concerning drying equipment. Prior to early 1991, I was a principal (President and CEO) in Birow, Incorporated, located at 8 Clover Lane, Westport, Connecticut 06880. Shortly after arriving at PRI in early 1991, as part of the negotiations with PRI, I was required to grant PRI an exclusive license in Birow's proprietary methods and apparatus developed by me. See Exhibit 5. That license included U.S. Patent Nos. 4,796,556 (Exhibit 6), 4,841,903 (Exhibit 7), 4,895,070 (Exhibit 8), and 4,939,992 (Exhibit 9), as well as a patent application, Serial Number 07/336,435, filed the same day as the application leading to the '992 patent, which I believe never issued. My experience that I brought to PRI was in the graphic arts, lithography, flexography, screen printing and coating applications, including the construction of coaters and driers. As of 1991, I do not recall flexographic applications existing in the offset lithography art other than end-of-press specialized applications. The arts were different. Flexography was used in the manufacture of boxes, bags and labels. I also brought with me to PRI a retractable, end-of-press coater, or "rack-back" coater as the term is often used in the industry. As I recall, we sold very few of these at PRI. A copy of a PRI brochure (printed about 1994) depicting this technology, which I brought to PRI, is attached hereto as Exhibit 10. At the time I arrived at PRI in early 1991, PRI was developing the so-called "E-Z" coater, which was developed in the early 1990s, and which used a chambered doctor system, the subject of several PRI patents (U.S. Patent Nos. 5,176,077, 5,207,159, and 5,335,596, attached hereto in a group as Exhibit 11). I believe I was the only person at PRI in 1991-1995 that had any significant experience in flexography. In hindsight, the only people anywhere in the world which would have had the motivation in 1994-1995 to go "upstream" with flexography in an offset lithography press would be a printer or a manufacturer of inks or coating, probably metallic inks or coatings. A small manufacturer of auxiliary equipment for presses, such as PRI, in my opinion would not have such motivation other than to produce a product in response to an order.

7. When I joined PRI in early 1991, the principal efforts of PRI were involved in the field of anti-marking technology. The company was heavily financially dependent on selling

specially-tailored sheets of cheesecloth as an anti-marking tool (U.S. Patent No. 4,402,267, Exhibit 26 hereto), the so-called "Superblue™" netting, to expire in September 6, 2000. I feel my contribution to PRI was primarily in the development of drying equipment, including end-of-press and interstation drying equipment and to introduce them to a retractable or "rack-back" coater.

8. In February 1991, at about the time I arrived at PRI, Howard DeMoore filed a lawsuit against WPC, styled *Printing Research, Inc. and Howard W. DeMoore v. Williamson Printing Corporation, Jerry B. Williamson, Jesse Williamson and Buford Roy Williams*, Civil Action No. 3:91-CV-0389-X (Northern District of Texas, Dallas Division), which was settled on or about October 1, 1993. The basic terms of the settlement had been worked out several months before October 1, 1993 (actually sometime in May 1993, as I recall), and accordingly, I started approaching Williamson in the early summer of 1993 to start purchasing PRI's products (see letter of June 25, 1993, authored by me, Exhibit 12). On several occasions in late 1993 and the first half of 1994, I dropped by the offices of WPC, providing brochures and handouts of PRI products I thought WPC might possibly be interested in.

9. I was aware in 1993 and 1994 that WPC was seeking to replace its aging printing presses with new, state-of-the art presses, and I was aware by July of 1994 WPC had more or less decided to go with Heidelberg U.S.A., Inc. and purchased several different presses, to be installed starting in late 1994 and running well into 1995. This presented PRI, in my opinion, with a significant opportunity, as PRI sold good auxiliary drying equipment. I was a major contributor at PRI into the invention, research and developing of drying equipment.

10. I became aware from Steven Baker, one of PRI's salesmen, upon his return in July 1994 from Atlanta, Georgia, of a meeting between Steven Baker, Jesse Williamson and Bill Davis of WPC. Steven Baker told me of a July 1994 meeting in an Atlanta restaurant in which Davis and Williamson told him (Baker), in confidence, of Davis and Williamson's intent to improve the so-called "WIMS" metallic printing process of WPC, U.S. Patent No. 5,370,976 (Exhibit 13), of which at the time I had some familiarity with the process, but not a lot. Baker

told me in July 1994 that WPC had already committed orally to purchasing dryer equipment from PRI for the line of Heidelberg printing presses, and that Baker had shown Jesse Williamson and Bill Davis a PRI-constructed HV interstation dryer at James River carton printing plant in Newnan, Georgia, and that Baker had been told of a pending WPC patent application for the "WIMS" process. Baker told me that as part of these discussions, they confided in Baker that they wanted to use flexography at a station they designated "up-stream" – perhaps even the first station – of one or more offset lithography presses that they would receive from Heidelberg. Baker mentioned to me at the time in July 1994 that they mentioned several ways in which this could be done -- most preferably, a retractable or "rack-back" mechanism, which would have to be modified for "upstream" use. Baker told me that with respect to the "rack-back" option told him by Davis and Williamson, they would have to have the retractable mechanism have an anilox roller, a chambered doctor, and the use of state-of-the-art flexographic plates. Baker told me that Davis and Williamson indicated they had just seen the use of some of these flexographic (BASF) plates in Germany, and that a number of companies sold high-resolution plates which would work in their new process. Baker told me that Davis and Williamson inquired whether PRI was interested in supplying these types of "rack-back" or retractable mechanisms, and that he (Baker) told Williamson and Davis of the PRI "rack-back" and provided a brochure, Exhibit 10. Effertz Tool Company, Franklin Lakes, New Jersey, made these "rack-backs" for me while at Birow, Incorporated, and Effertz continued to make these "rack-backs" for PRI for the few units PRI sold when I brought the technology to Dallas.

11. Pursuant to what I understood to be an oral agreement in July to purchase equipment from PRI, I passed along product information in detailed form to WPC regarding the drying equipment WPC had promised to purchase from PRI on August 31, 1994 (Exhibit 14). WPC had signed an agreement on October 1, 1993 with PRI to purchase a significant amount of drying equipment, including interstation drying equipment (note my memorandum of September 6, 1994 (Exhibit 15), and Howard DeMoore's acknowledgment on the very same day that the terms of the Settlement Agreement had been complied with contingent on completion

of the purchase (Exhibit 16)). I supplied WPC with a final purchase agreement schedule on September 15, 1994 (Exhibit 17).

12. Steve Baker also told me on his return to Dallas in July 1994 that Davis and Williamson wanted some experiments run at PRI using my "rack-back" (note again brochure, Exhibit 10). I recall such experiments at PRI conducted in the fall of 1994. These tests were done on PRI's two-color Heidelberg R&D press utilizing an existing "rack back" coater of my design at the end of the press, at the direction of WPC, with WPC supplying most of the flexographic inks and the flexographic plates for the experiments. The tests were chiefly designed to determine the resolution that was possible with the PRI coater, and supplied plates and coatings. No one-pass tests of the claimed '363 process were done in the fall at PRI. In fact, to the best of my knowledge, no tests were ever conducted at PRI of the '363 invention, only at WPC. In fact, to the best of my knowledge, no off-line simulated tests (flexography done first with a second pass of performing offset lithography in a pass-through) were ever performed at PRI. I never collaborated with Bill Davis or Jesse Williamson or anyone else at Williamson concerning the '363 invention in 1994 or 1995. Again, PRI, to the best of my knowledge, does not have any late 1994 or early 1995 record, notebooks, e-mails or memoranda concerning any conception by PRI of the '363 claimed invention.

13. I suggested that my colleagues start working toward an acceptable flexographic printer coater for use with the Davis-Williamson '363 process. In the late fall of 1994, pursuant to my recommendations, PRI did start working on what was termed in-house as the "Rendleman coater," the first prototype being a cantilevered, "short-arm" device that would fit on an end-of-press Heidelberg-manufactured coating tower of the first Heidelberg press to arrive at Williamson – the so-called "7 color Heidelberg CD." The purpose of our development of the device was clear: we did this to try to get all of WPC's business. We had no firm orders from them for this equipment. That prototype was actually not installed at WPC until late February 1995. The following documents illustrate the timing of development of this short-armed device, which was not intended for interstation deployment, but for use on the low profile of the tower

coater with the intention of going upstream at a later date. On December 16, 1994, I wrote a memorandum to Bill Davis of Williamson (Exhibit 18), in which construction of the proposed short-arm device was not even mentioned. As of that time, only parts of it had been developed by Ron Rendleman, and sat on the floor at PRI. I did not mention the "short arm" device in the December letter. Steve Baker did not even mention the short-arm prototype in his late January 1995 letter to Jesse Williamson (Exhibit 19). Had PRI had the prototype near ready for installation, it would have been mentioned in a letter. In my opinion, the time to develop short-arm prototype of the "Rendleman coater," which was a crude, manually operated device, which took more than 90 days, taken even at a causal pace. Working back from a late February installation, it is clear work on the "short-arm" experimental coater started no earlier than December 1994, which is consistent with my recollection. The "short-arm" device was never intended to perform as an interstation flexographic coater, and could not have. The reason why PRI started working on an experimental, cantilevered end-of-press printer-coater, rather than an interstation unit to perform the '363 process, was that in December 1994 PRI had no commitment from WPC to order such devices, there was no established market for an interstation, and no one at PRI appreciated, much less knew of the details of the '363 inventive process outside of the disclosure made to Baker.

14. I recall that in January 1995 a meeting took place in Conference Room "E" at WPC attended by Steve Baker, me, Bill Davis and Jesse Williamson. At this meeting, Jesse Williamson told Steve Baker and me that he (Williamson) and Davis were going to file for a patent on their new process. I recall commenting to Steve Baker going back in the car to the offices at PRI that I thought it was amazing that anyone could patent a process apart from the equipment – the so-called "iron," which is a term used by many people in our business. I thought it was a brilliant move, but did not know whether such patenting could take place. I had several patents issue to me as of January 1995 (Exhibits 6-9), but didn't know that such a process could be patented, however meritorious.

15. I recall another meeting which took place on February 11, 1995. Jesse Williamson and Bill Davis told me that they had gone to Germany to the Heidelberg Company. They informed me in confidence that they had had tests conducted on a simulated reduction-to-practice of the new process to be patented, using state-of-the-art BASF plates at the Heidelberg Company with German and British flexographic inks. They indicated they had compared in Germany the results of a gold and silver Rolex advertisement they had previously made using the "ordinary" WIMS process, with a simulation of the new process, using multiple passes comprising flexography performed first, followed by offset lithography. They indicated to me on February 11, 1995 that the German tests confirmed the advantages and benefits of their new process. Accordingly, they committed not only to installing the existing short-arm prototype still in production at PRI, but for PRI to install a long-arm device for interstation use at WPC if PRI could come up with a workable design. Accordingly, I sent them a confirmatory memorandum on February 16, 1995 (Exhibit 20), indicating that the "short-arm" end-of-press unit was to be provided for no cost. We actually installed the "short-arm" unit at the end of February, 1995. We did not even have a sketch of the interstation coater to provide Williamson until March of 1995 – let alone completed blueprints -- and our development of the interstation coater was just a concept in late April 1995 when we had brochures printed in gold and silver – not even with the improved process (Exhibit 21). We provided an incomplete sketch of the prototype interstation "Rendleman coater" to Bill Davis in March 1995, which was apparently completed by Davis and Williamson, modified and put in the '363 process as Fig. 2. The first of the interstation units was not installed until late August, or early September 1995, as I recall.

16. In late March of 1995 I observed as part of a team of employees at PRI a simulated reduction of the '363 process using the "short-arm" device – i.e., "offline" (as Bill Davis and Jesse Williamson called it) – for a customer in Washington, D.C. (Brian Liester, Hi Fi Color, Mills Davis)). The simulated reduction was conducted at WPC, using state-of-the-art plates and flexographic inks, under the direction of Bill Davis. The work done for Liester later won an industry prize in the fall of 1995 (PIA's Premier Print Awards), at Chicago, Illinois. To

the best of my knowledge, no one at PRI ever claimed that PRI should share in the recognition of that prize.

17. In March 1995, I test marketed a closed doctor blade chamber recirculation system at a graphics show held biannually in Charlotte, NC. John Lapomarde (retired) previously with Rexham Corporation, had purchased such a unit. PRI sold a system to Lapomarde for installation at the end of his Komori multi-color press, replacing an application roller with an anilox roller, and installing PRI's recirculation closed doctor blade system, on or about mid-to-late 1994. Prior to the installation, we ran tests at PRI to apply metallics and coating using the retractable coater at the end of PRI's two-color Heidelberg press. Howard DeMoore and Ron Rendleman had no input into the tests or our process. Sometime in the spring of 1995 Steve Garner and I showed Jesse Williamson the flexo-applied gold sheets shortly thereafter. That was my first inkling of the potential and subsequent idea to install such device upstream on a litho press. I do not recall writing any memorandum, notebooks, e-mails, or other writings at PRI describing this concept. I never told anyone at WPC about this process.

18. On May 2, 1995, Steve Garner of PRI and I had a meeting at the offices of WPC with Jerry Williamson, Jesse Williamson, Bill Davis and Woody Dixon. The issue of who had what exclusive rights to what part of these marvelous inventions – the process and the "Rendleman coater" -- came up for the first time, as I recall. No one from PRI questioned WPC's and Davis' and Williamson's rights to patent the process, if they could – after all, they had told us about the process back in July 1994. This meeting was the first in a series of meetings to discuss potential exclusivity in WPC to sell the interstation "Rendleman coater" – which had not even been developed yet, let alone reduced to practice. Our original proposal was that PRI would agree to give WPC some degree of exclusivity on selling the "Rendleman coater" to others. In this same time frame, Ron Rendleman, Howard DeMoore and I signed a U.S. patent application to the "Rendleman coater" on May 4, 1995 or a day before, without telling WPC about it. WPC never claimed in our meetings, or in any letter to PRI to the best of my knowledge that any of their people invented the "Rendleman coater." They just wanted us to

come up with an interstation coater to perform their process, which we did. They could have gone to any one of a number of manufacturers of end-of-press auxiliary coaters and had these devices modified in a relatively short amount of time for interstation deployment. It is my belief that WPC chose PRI because of the October 1, 1993 settlement agreement. Our May 4, 1995 application, as I understood it then and understand it now – did not claim the '363 process. We could not have claimed the process. First, we were not the inventors of the process, and second, we had insufficient information about conducting the process or the results to be expected to make a good disclosure. As of May 4, 1995, PRI knew that WPC intended to file a process application, if it had not already done so. On May 12, 1995 I wrote a confirmatory letter concerning the first interstation unit for WPC (Exhibit 22), which we promised would arrive in mid-August. In fact, it was several weeks late. The short period of 90 days for completion indicated in my May 12, 1995 letter was a reasonable time for the development and installation WPC could have obtained from any other existing competent manufacturer of an auxiliary unit modified for interstation deployment.

19. After my May 12, 1995 letter, PRI and WPC went back and forth in negotiations concerning the extent to which WPC could sell exclusively the "Rendleman coater." To the best of my knowledge, the parties were close but never reached an agreement in writing. It was a failed cross-licensing negotiation, as the correspondence clearly shows.

20. Four cantilevered "Rendleman coaters" were delivered to WPC. To the best of my knowledge, PRI delivered two interstation "Rendleman coater" units to WPC in 1995-1996, the first of which was delivered in late August 1995. End-of-press units were delivered in late February 1995 (the experimental prototype) and early 1996.

21. To the best of my knowledge, WPC never gave PRI a license to make, use, or sell the "Rendleman coater" for performing interstation '363 process. I am not aware of any effort on the part of PRI to approach WPC at any time for such a '363 process license for PRI or the Hallmark Company or anyone else.

22. On October 2, 1995 Rendleman, DeMoore and I filed a second, now series of four patent applications directed to interstation use of flexography where the flexographic stations were not auxiliary units, but dedicated – the press units would have to be substantially modified. To the best of my knowledge, this invention was never actually reduced to practice by PRI, let alone sold. Of the four applications filed in the United States, three were carried forward overseas in Europe and Japan, and three have issued in the United States – U.S. Patent Nos. 5,598,777 (Exhibit 23), 5,651,316 (Exhibit 24 and very recently, 5,960,713 (Exhibit 25). These patents have as originally filed the same specification. They have nothing to do with the "Rendleman coater" and did not claim the '363 process.

23. The European counterpart of the May 4, 1995 "Rendleman coater" application was published about 18 months after May 4, 1995, i.e., November 6, 1996. (Note EP 741 025 A3, item (43), Exhibit 27).

24. Accordingly, when I review PRI's complaint, I find no important factual merit to it whatsoever. The invention of the '363 patent has never been installed or used outside of WPC. The "Rendleman coater" was developed at the suggestion of Bill Davis and Jesse Williamson for WPC. Neither Ron Rendleman or I ever developed the '363 process, let alone Howard DeMoore. Had PRI invented the process, PRI would never have taken prototypes outside the offices of PRI or told a customer about it without detailed secrecy agreements. Moreover, in my opinion, PRI had no motivation to come up with the process invention because it did not utilize the WIMS process out of which I believe the '363 patent originated. To the best of knowledge, no one at PRI ever told the '363 invention to Davis and Williamson – the reverse I know occurred in July 1994. PRI did not even have the facilities to reduce the '363 invention to practice – even by simulation. If PRI had the capability to use or to simulate the '363 process, the 1995 brochure would have been printed by the new '363 process. The brochure was not. I know intimately the details of the development of the "Rendleman coater" in 1994-1995, had numerous discussions on a week-to-week basis with Rendleman, kept DeMoore informed as to the progress of its development and the installations of the "short arm" (late February 1995) and

long-arm devices, and attended the few experiments in the fall of 1994 and the few meetings in 1995 where employees of the two companies met. No experimental or developmental work – no collaboration – occurred between PRI and WPC. Howard DeMoore was never involved in the conception or development of the interstation "Rendleman coater" – he was virtually never in PRI's offices. To the best of my knowledge, the '363 invention is the genius of Jesse Williamson, who is a visionary, and Bill Davis whose printing process experience made it possible to bring it about.

25. Contrary to the allegations in the Complaint, Exhibit 4, Howard DeMoore did not conceive, invent, reduce to practice, or develop the '363 invention, or any individual or team at PRI. I was the one responsible at PRI for trying to get the Hallmark business, and no one at WPC ever told anyone at Hallmark, to the best of my knowledge, not to do business with us. As far as I know, neither I nor Hallmark approached WPC for a license to the '363 technology. The '363 patent issued in May 1997 and of course, such a license would have been appropriate had Hallmark wanted to practice the '363 process.

26. As indicated by the testimony and Exhibits above, DeMoore and PRI have misrepresented the true facts, or are simply mistaken, in paragraphs 10-17 of the Complaint. The errors are too numerous to list here. I will give some examples. First, the tests conducted at PRI in October 1994 were at the suggestion of Williamson and Davis, and did not illustrate "potential applications of that technology." Second, DeMoore did not conceive and begin development of the "Lithoflex system," which is described in the Complaint to include the '363 process. I was not "contacted by Williamson employees" to learn the "Lithoflex" process in November 1994 (paragraph 13). Third, I did not describe the "Lithoflex system" to anyone at Williamson (paragraph 13) let alone "details" (paragraph 14). Fourth, to the best of my knowledge, no written confidentiality agreement was in place (paragraph 15). Fifth, Williamson never agreed to let us test generally the "Rendleman coater" at the offices of WPC (paragraph 16), let alone

to give PRI a broad-based license to practice the '363 invention. Sixth, the first or "short-arm" experimental "Rendleman coating unit" was delivered in late February 1994, and was end-of-press. Seventh, the first "long-arm" or interstation unit was delivered in late August or early September 1995. Thus, the date given in paragraph 17 of the Complaint of November 1995 is wrong. Again, these are just examples of the misinformation in the Complaint.

The undersigned Declarant stated further that all statements made herein of Declarant's own knowledge are true, and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

John W. Bird

12-11-99

Date:

Prior to 1982 all employment experience was in the UK

1977 - 1982

Colordy Ltd. (Spectral Ltd., and now owned by Nordson)
Partner & Technical Sales Director

- Founding partner for UV and IR drying systems.
- Directed development and sales marketing efforts for drying systems from $75K in 1977 to $1.5M in 1981.

1974 - 1977

Print Dimensions Ltd.
Technical and Sales Director

- Developed and marketed proprietary three-dimensional vacuum-formed plastic products.

1970 - 1974

McCorquodale Plastics/Associated Trapinex Ltd.
Works Manager

- Managed production of litho, screen-printing and plastic laminating in the manufacture of credit cards and plastic point of purchase display products.

1965 - 1970

Sericol Group Ltd.
Development Chemist

- Developed various ink systems for the screen-printing industry.
- Developed coating methods and photographic film for the screen printing industry.

1960 - 1965

Ault & Wiborg Ltd.
Development Chemist

- Manufactured ink for litho, and developed some of the first web offset heatset inks in the UK.

EDUCATION:

1960 - 1965 London College of Printing
1956 - 1960 St. Gerard's RC Secondary School

ACHIEVEMENTS (US):

Nine patents issued, two GATF (Graphic Arts Technical Foundation) Intertech Awards, Special Mention AICC Technical Merit Award for HV Drying. Articles published in "Boxboard Containers", "Graphic Arts Monthly", "TAPPI Journal" and "GATF Technical Manual", Introduction and development coating litho, and flexo, technical presentations made to AICC, GATF, TAPPI, University of Wisconsin and various Litho Clubs.

ACHIEVEMENTS (UK):

City and Guilds Printing Ink Technicians Certificate, Member Institute of Printing (M.I.O.P.), Chairman Screen Printers Association, Six Patents Issued, Articles published in "Professional Printer", "Folding Carton", "British Printing and Screen Printing" trade magazines, Introduction and Development of short-wave infrared and "Cold" UV Drying Systems.

PERSONAL:

Date of birth, August 10, 1945. Married with three children (ages 33, 20, and 28).

INDUSTRY REFERENCES AVAILABLE UPON REQUEST.

Reissue of U. S. Patent No. 5,630,363

CLAIMS

Note: Bracketed material in the following claims has been deleted from U. S. Patent 5,630,363 as issued; underlined materials, including new claims 42-84 has been added.

1. Apparatus for a combined lithographic/flexographic printing process comprising:

a substrate;

a plurality of successive printing stations for printing color images on the substrate in a continuous in-line process;

one of said stations comprising a flexographic printing station for printing a liquid vehicle image on said substrate with a slurry containing an encapsulated essence using the flexographic process;

at least one of said successive printing stations being a lithographic printing station; and

an overcoating applied over the liquid vehicle image on the printed substrate at least one of said successive lithographic printing stations using the lithographic process in said continuous in-line process.

2. Apparatus as in claim 1 wherein said overcoating is an aqueous overcoating.

3. Apparatus as in claim 1 wherein said overcoating is an ultraviolet ink overcoating.

4. Apparatus as in claim 1 wherein:

said substrate is a paper sheet; and

said apparatus includes a sheet feeder.

5. Apparatus as in claim 1 wherein:

said substrate is a web; and

said apparatus includes a web feeder.

6. Apparatus for a combined lithographic/flexographic printing process comprising:

a plurality of successive printing stations for printing color images on a substrate in a continuous in-line process;

one of said stations comprising a flexographic printing station printing an aqueous-based vehicle image using the flexographic process to form a metallic coating;

a suspended metallic material being included in said aqueous-based vehicle image; and

at least one of the successive printing stations comprising an offset lithographic printing station printing a color image over the aqueous-based vehicle image using the offset lithographic process in said continuous in-line process.

7. Apparatus as in claim 6 wherein said suspended material includes uniform-sized metal particles to form said metallic coating.

8. Apparatus as in claim 6 wherein said suspended material includes nonuniform-sized metal particles to form said metallic coating.

9. Apparatus as in claim 6 further including: said flexographic printing station including a plate cylinder having a flexographic plate thereon, a blanket cylinder, and an impression cylinder;

a flexographic plate image transferred from said plate cylinder to said blanket cylinder, said image being formed of said metallic coating, said blanket cylinder transferring said metallic coating to said impression

cylinder for printing said flexographic plate image on said substrate; and

an anilox roller associated with said flexographic plate for supplying said aqueous-based vehicle containing said suspended metallic material to said flexographic plate.

10. Apparatus for creating a combined lithographic/flexographic printing process comprising:

a plurality of successive printing stations for printing color images on a substrate in a continuous in-line process;

one of said stations comprising a flexographic printing station for printing a first color image using the flexographic process; and

at least one of the successive printing stations comprising an offset lithographic printing station for printing a second color image over the first color image using the offset lithographic process in said continuous in-line process.

11. Apparatus as in claim 10 further including:

said flexographic printing station including a plate cylinder, a blanket cylinder, and an impression cylinder;

a flexographic plate on said plate cylinder;

an anilox roller associated with said flexographic plate for supplying a first color to said flexographic plate to form said first color image; and

said blanket cylinder receiving said first color image from said plate cylinder and transferring said first color image to said impression cylinder for printing on said substrate.

12. Apparatus for creating a combined lithographic/flexographic printing process comprising:

a substrate;

a plurality of successive printing stations for printing color images on the substrate in a continuous in-line process;

at least two successive ones of said printing stations being flexography stations and comprising:

(1) a supply of liquid coating;

(2) a plate cylinder associated with a blanket cylinder, said plate cylinder having a flexographic plate thereon;

(3) an anilox roller associated with said liquid supply coating and said plate cylinder for delivering said liquid coating to said flexographic plate to form an image for transfer to said blanket cylinder;

(4) an impression cylinder for receiving said liquid coating image transferred from said blanket cylinder and printing said image on said substrate, said at least two flexography stations printing the same liquid coating image in sequence and in superimposed relationship; and

at least one offset lithographic printing station for receiving said substrate and printing over said liquid coating image.

13. Apparatus as in claim 12 wherein said liquid coating image printed on said substrate is a white color ink.

14. Apparatus as in claim 12 further including an air dryer associated with each of said impression cylinders on said flexography stations, said air dryer having sufficient air velocity for drying said liquid coating before the substrate is transferred to the successive printing station in said continuous in-line process.

15. Apparatus for a combined lithographic/flexographic printing process comprising:

a plurality of successive printing stations for printing color images on a substrate in a continuous in-line process, said printing stations including both lithographic and flexographic printing stations;

a blanket cylinder at at least a first one of said flexographic printing stations;

flexographic ink-providing means at said at least first one of said flexographic printing stations for applying a flexographic ink to said blanket cylinder to form an image;

a substrate for receiving said flexographic ink image transferred from said blanket cylinder; and

at least one subsequent lithographic printing station in said in-line process for receiving said image printed substrate and printing an additional colored ink image on said substrate on top of said flexographic ink image using offset lithography.

16. Apparatus as in claim 15 further comprising:

a plate cylinder at said at least first one of said flexographic stations;

a flexographic plate on said plate cylinder for receiving and transferring said flexographic ink to said blanket cylinder; and

said flexographic ink-providing means including a flexographic ink supply and an anilox roller associated with said flexographic ink supply for transferring said flexographic ink to said flexographic plate.

17. Apparatus for a combined lithographic/ flexographic printing process for printing a multicolored image comprising:

a plurality of successive printing stations for printing color on a substrate in a continuous in-line process, said printing stations including both lithographic and flexographic printing stations;

at least one of said flexographic printing stations having:

(1) a plate cylinder and a blanket cylinder, said plate cylinder including a flexographic plate having an

image thereon for transferring a flexographic color ink image to said blanket cylinder;

(2) an etched anilox roller for applying a flexographic color ink to said flexographic plate on said plate cylinder;

(3) an impression cylinder in ink-transfer relationship with said blanket cylinder for transferring said flexographic color ink image from said blanket cylinder to said substrate; and

at least one of said succeeding printing stations being a lithographic printing station using offset lithography for printing additional colored ink images on top of said flexographic ink image.

18. Apparatus as in claim 17 wherein said additional colored ink images are formed with lithographic inks.

19. Apparatus as in claim 17 wherein said colored ink images are formed with waterless inks.

20. Apparatus as in claim 17 further including an air dryer adjacent to said impression cylinder for drying the flexographic ink image transferred to said substrate before said additional colored ink images are printed thereon.

21. Apparatus as in claim 17 further including halftone printing plates for printing said colored ink images.

22. Apparatus as in claim 17 wherein said flexographic ink image and said colored ink images are printed as solid colors and/or with halftone printing plates in sequence and in registry in said successive printing stations to produce said multicolored image on said substrate.

23. Apparatus as in claim 17 wherein said printing apparatus includes a sheet-fed press.

24. Apparatus as in claim 17 wherein at least one of said flexographic printing stations prints said flexographic ink image with liquid vehicle slurry containing an encapsulated essence.

25. Apparatus as in claim 17 wherein at least one of said printing stations prints said flexographic ink image with a water-based liquid vehicle containing suspended particles.

26. Apparatus as in claim 25 wherein said suspended particles are uniform in size.

27. Apparatus as in claim 25 wherein said suspended particles are nonuniform in size.

28. Apparatus as in claim 25 wherein said suspended particles are metallic particles.

29. A method of combining lithography and flexographic printing in a continuous in-line process comprising the steps of:

providing a plurality of successive lithographic/flexographic printing stations for printing colored ink images on a substrate;

printing a flexographic ink image on said substrate at at least one of said flexographic stations;

transferring said printed substrate to at least one subsequent printing station in said continuous in-line process; and

printing colored ink images [on top of] <u>over</u> said flexographic ink image at at least one of said subsequent lithographic printing stations with an offset lithographic process.

30. A method as in claim 29 further comprising the step of drying said flexographic ink image on said substrate with an air dryer prior to printing said colored ink images thereon.

31. A method as in claim 29 further including the step of printing a coating on top of said colored ink images at one of said plurality of subsequent printing stations.

32. A method as in claim 29 wherein said colored inks forming said colored ink images are waterless.

33. A method as in claim 29 wherein said colored inks forming said colored ink images are in a solvent-based liquid vehicle.

34. A method as in claim 29 further including the steps of:

printing a slurry on said substrate at any of said printing stations in said continuous in-line process;

using an encapsulated essence in said slurry; and

printing an overcoating [over] on top of said slurry at a subsequent printing station in said in-line process to protect said essence.

35. A method as in claim 34 further including the step of printing an aqueous-based coating over said slurry.

36. A method as in claim 34 further including the step of printing an ultraviolet coating over said slurry.

37. A method of combining offset lithography and flexographic printing in a continuous in-line process comprising the steps of:

providing a substrate;

applying a flexographic ink to a blanket cylinder in a pattern with a coating head at a first flexographic printing station;

transferring said pattern of flexographic ink from said blanket cylinder to the substrate; and

printing a waterless ink pattern over said flexographic ink pattern on said substrate at at least one subsequent offset lithographic printing station in said continuous in-line process.

38. A method of combining lithography and flexographic printing in a continuous in-line process comprising the steps of:

printing an aqueous-based vehicle image having suspended particles therein on a substrate at a first flexographic printing station;

transferring said image printed substrate to at least one additional printing station in said continuous in-line process; and

printing additional colored ink images on said printed substrate over said aqueous-based vehicle image in an offset lithographic process at said at least one additional printing station in said in-line process.

39. A method of combining lithography and flexographic printing in a continuous in-line process comprising the steps of:

(1) providing a plurality of successive printing stations for printing liquid vehicle images on a substrate in said in-line continuous process;

(2) utilizing an anilox roller to transfer a liquid ink as said liquid vehicle to a flexographic plate image at at least one of said printing stations;

(3) printing said liquid ink from said flexographic plate image to a substrate;

(4) transferring said printed substrate with said liquid ink image to a subsequent printing station in said in-line printing process;

(5) repeating steps (2)-(4) at subsequent printing stations in said in-line process to achieve a desired opacity ink image on said substrate; and

(6) printing an ink pattern over said flexographic ink image using an offset lithographic process.

40. A method as in claim 39 further including the step of additionally printing colored ink images over said liquid ink image on said substrate at subsequent ones of said printing stations in said in-line process.

41. A method as in claim 40 wherein said liquid ink is an opaque white color.

42. The apparatus of any of claims 1, 6, 10, 12, 15 and 17, wherein the substrate is printed on both sides in one pass during the continuous in-line process.

43. The method of any of claims 29, 37, 38 or 39 wherein the substrate is printed on both sides in one pass during the continuous in-line process.

44. Apparatus for a combined lithographic/flexographic printing process comprising:

a substrate;

a plurality of successive printing stations for depositing a series of thin, controlled layers on one side of a substrate in a continuous in-line process;

one of said stations comprising a flexographic printing station for printing a liquid vehicle image on said substrate using a flexographic process; and

at least one of said successive printing stations being a lithographic printing station;

whereby said substrate is printed on top of or on the opposite side of that previously printed at at least one of said successive lithographic printing stations using the lithographic process in said continuous in-line process.

45. Apparatus as in claim 44 wherein at least one of said thin, controlled layers at the flexographic station is a coating material.

46. Apparatus as in claim 44 wherein at least one of said thin, controlled layers at one of the lithographic stations is an ink.

47. Apparatus as in claim 44 wherein:

said substrate is a paper sheet; and

said apparatus includes a sheet feeder.

48. Apparatus as in claim 44 wherein:

said substrate is a web; and

said apparatus includes a web feeder.

49. The apparatus of claim 44 for a combined lithographic/flexographic printing process comprising:

a plurality of successive printing stations for depositing a series of thin, controlled layers on a substrate in a continuous in-line process;

one of said stations comprising a flexographic printing station printing an aqueous-based vehicle on one side of the substrate using the flexographic process to form a metallic coating image;

a suspended metallic material being included in said aqueous-based vehicle; and

at least one of the successive printing stations comprising an offset lithographic printing station printing a color image on top of the aqueous-based vehicle or on the opposite side to that previously printed using the offset lithographic process in said continuous in-line process.

50. Apparatus as in claim 49 wherein said suspended material includes uniform-sized metal particles to form said metallic coating.

51. Apparatus as in claim 49 wherein said suspended material includes nonuniform-sized metal particles to form said metallic coating.

52. Apparatus as in claim 49 further including: said flexographic printing station including a plate cylinder having a flexographic plate thereon, a blanket cylinder, and an impression cylinder;

a flexographic plate image transferred from said plate cylinder to said blanket cylinder, said image being formed of said metallic coating, said blanket cylinder transferring said metallic coating to said impression cylinder for printing said flexographic plate image on said substrate; and

an anilox roller associated with said flexographic plate for supplying said aqueous-based vehicle containing said suspended metallic material to said flexographic plate.

53. Apparatus for creating a combined lithographic/flexographic printing process comprising:

a plurality of successive printing stations for depositing a series of thin, controlled layers on a substrate in a continuous in-line process;

one of said stations comprising a flexographic printing station for printing a first color image using the flexographic process; and

at least one of the other successive printing stations comprising an offset lithographic printing station for printing a second color image on the reverse side of the substrate of the first color image using the offset lithographic process in said continuous in-line process.

54. Apparatus as in claim 53 further including:

said flexographic printing station including a plate cylinder, a blanket cylinder, and an impression cylinder;

a flexographic plate on said plate cylinder;

an anilox roller associated with said flexographic plate for supplying a first color to said flexographic plate to form said first color image; and

said blanket cylinder receiving said first color image from said plate cylinder and transferring said first color image to said impression cylinder for printing on said substrate.

55. Apparatus for creating a combined lithographic/flexographic printing process comprising:

a substrate;

a plurality of successive printing stations for depositing a series of thin, controlled layers on a substrate in a continuous in-line process;

at least one of said printing stations being flexographic stations and comprising:

(1) a supply of liquid coating;

(2) a plate cylinder associated with a blanket cylinder, said plate cylinder having a flexographic plate thereon;

(3) an anilox roller associated with said liquid supply coating and said plate cylinder for delivering said liquid coating to said flexographic plate to form an image for transfer to said blanket cylinder;

(4) an impression cylinder for receiving said liquid coating image transferred from said blanket cylinder and printing said image on one side of said substrate; and

at least one offset lithographic printing station for receiving said substrate and printing on top of or on the opposite side to that previously printed.

56. Apparatus as in claim 55 wherein said liquid coating image printed on said substrate is a white color ink.

57. Apparatus as in claim 56 further including an air dryer associated with each of said impression cylinders on said flexography stations, said air dryer having sufficient air velocity for drying said liquid coating before the substrate is transferred to the successive printing station in said continuous in-line process.

58. Apparatus for a combined lithographic/ flexographic printing process comprising:

a plurality of successive printing stations for depositing a series of thin, controlled layers on a substrate in a continuous in-line process, said printing stations including both lithographic and at least two flexographic printing stations;

a blanket cylinder at at least a first one of said flexographic printing stations;

flexographic ink-providing means at the other of said flexographic printing stations for applying a flexographic ink to said blanket cylinder to form an image on one side of a substrate;

a substrate for receiving said flexographic ink image transferred from said blanket cylinder; and

at least one subsequent lithographic printing station in said in-line process for receiving said image printed substrate and printing an additional colored ink image on said substrate on top of said flexographic ink image or the opposite side to that previously printed using offset lithography.

59. Apparatus as in claim 58 further comprising:

a plate cylinder at said at least first one of said flexographic stations;

a flexographic plate on said plate cylinder for receiving and transferring said flexographic ink to said blanket cylinder; and

said flexographic ink-providing means including a flexographic ink supply and an anilox roller associated with said flexographic ink supply for transferring said flexographic ink to said flexographic plate.

60. Apparatus for a combined lithographic/ flexographic printing process for printing a multicolored image comprising:

a plurality of successive printing stations for depositing a series of thin, controlled layers on a substrate in a continuous in-line process, said printing stations including both lithographic and flexographic printing stations;

at least one of said flexographic printing stations having:

(1) a plate cylinder and a blanket cylinder, said plate cylinder including a flexographic plate having an image thereon for transferring a flexographic color ink image to said blanket cylinder;

(2) an etched anilox roller for applying a flexographic color ink to said flexographic plate on said plate cylinder;

(3) an impression cylinder in ink-transfer relationship with said blanket cylinder for transferring said flexographic color ink image from said blanket cylinder to one side of said substrate; and

at least one of said succeeding printing stations being a lithographic printing station using offset lithography for printing additional colored ink images on top of said flexographic ink image or on the opposite side to that that previously printed.

61. Apparatus as in claim 60 wherein said additional colored ink images are formed with lithographic inks.

62. Apparatus as in claim 60 wherein said colored ink images are formed with waterless inks.

63. Apparatus as in claim 60 further including an air dryer adjacent to said impression cylinder for drying the flexographic ink image transferred to said substrate before said additional colored ink images are printed thereon.

64. Apparatus as in claim 60 further including halftone printing plates for printing said colored ink images.

65. Apparatus as in claim 60 wherein said flexographic ink image and said colored ink images are printed as solid colors and/or with halftone printing plates in sequence and in registry in said successive printing stations to produce said multicolored image on said substrate.

66. Apparatus as in claim 60 wherein said printing apparatus includes a sheet-fed press.

67. Apparatus as in claim 60 wherein at least one of said flexographic printing stations prints said flexographic ink image with liquid vehicle slurry containing an encapsulated essence.

68. Apparatus as in claim 60 wherein at least one of said printing stations prints said flexographic ink image with a water-based liquid vehicle containing suspended particles.

69. Apparatus as in claim 68 wherein said suspended particles are uniform in size.

70. Apparatus as in claim 68 wherein said suspended particles are nonuniform in size.

71. Apparatus as in claim 68 wherein said suspended particles are metallic particles.

72. A method of combining lithography and flexographic printing in a continuous in-line process comprising the steps of:

providing a plurality of successive lithographic/ flexographic printing stations for depositing a series of thin, controlled layers on a substrate;

printing an image as one of said thin controlled layers on one side of said substrate at at least one of said flexographic stations;

transferring said printed substrate to at least one subsequent printing station in said continuous in-line process; and

printing an image on the reverse side of said substrate having said flexographic ink image, at at least one of said other subsequent lithographic printing stations with an offset lithographic process in the continuous in-line process.

73. A method as in claim 72 further comprising the step of drying said flexographic ink image on said substrate with an air dryer prior to printing said colored ink images thereon.

74. A method as in claim 72 further including the step of printing a coating on top of said colored ink images at one of said plurality of subsequent printing stations.

75. A method as in claim 72 wherein said colored inks forming said colored ink images are waterless.

76. A method as in claim 72 wherein said colored inks forming said colored ink images are in a solvent-based liquid vehicle.

77. A method as in claim 72 further including the steps of:

printing a slurry on one side of said substrate at any of said printing stations in said continuous in-line process;

using an encapsulated essence in said slurry; and

printing an ink on the reverse side of said substrate at a subsequent printing station in said in-line process.

78. A method as in claim 77urther including the step of printing an aqueous-based coating over said slurry.

79. A method as in claim 77 further including the step of printing an ultraviolet coating over said slurry.

80. A method of combining offset lithography and flexographic printing in a continuous in-line process comprising the steps of:

providing a substrate;

applying an ink or coating to a blanket cylinder in a pattern with a coating head at a flexographic printing station;

transferring said pattern of ink or coating from said blanket cylinder to one side of the substrate; and

printing a waterless ink pattern on the reverse side of said substrate at at least one subsequent offset lithographic printing station in said continuous in-line process.

81. A method of combining lithography and flexographic printing in a continuous in-line process comprising the steps of:

printing an aqueous-based vehicle having suspended particles therein on one side of a substrate at a flexographic printing station to form an image;

transferring said image printed substrate to at least one additional printing station in said continuous in-line process; and

printing additional images on the reverse side of said printed substrate in an offset lithographic process at said at least one additional printing station in said in-line process.

82. A method of combining lithography and flexographic printing in a continuous in-line process comprising the steps of:

(1) providing a plurality of successive printing stations for depositing a series of thin, controlled layers on a substrate in said in-line continuous process;

(2) utilizing an anilox roller to transfer a liquid ink as one of said thin controlled layers to a flexographic plate image at at least one of said printing stations;

(3) printing said liquid ink from said flexographic plate image to one side of a substrate;

(4) transferring said printed substrate with said liquid ink image to a subsequent printing station in said in-line printing process;

(5) repeating steps (2)-(4) at subsequent printing stations in said in-line process to achieve a desired opacity ink image on the one side of said substrate; and

(6) printing an ink pattern on the reverse side of said substrate using an offset lithographic process.

83. A method as in claim 82 further including the step of additionally printing ink images over said liquid ink image on said substrate at subsequent ones of said printing stations in said in-line process.

84. A method as in claim 83 wherein said liquid ink is an opaque white color.

85. A method of combining offset lithography and flexography using a plurality of successive printing stations in a continuous in-line process comprising:

(1) printing an image at one or more of said printing stations on a substrate using an offset lithographic process;

(2) transferring said image printed substrate to an additional printing station and printing at said additional printing station a coating on all or part of said image on said substrate;

(3) transferring said substrate to one or more additional printing stations for printing the reverse side of the said substrate; and

(4) printing an image on said reverse side of said substrate at one of such one or more printing stations using an offset lithographic process in the continuous in-line process.

86. Apparatus for a combined offset lithographic and flexographic printing process comprising:

(1) a substrate;

(2) a plurality of successive printing stations for depositing a series of thin layers of materials selected from a group consisting of lithographic and flexographic inks, coatings and slurries on one or both sides of a substrate in a continuous in-line process;

(3) at least one of said stations comprising a flexographic printing station for printing one of said flexographic materials on said substrate using a flexographic process;

(4) at least one of said successive printing stations being an offset lithographic printing station whereby said offset lithographic printing station is used to deposit one of said lithographic materials on either side of the said substrate in the continuous in-line process;

87. Apparatus for a combined offset lithographic/flexographic printing process comprising:

a plurality of successive printing stations for printing images on a substrate in a continuous in-line process, said printing stations including both offset lithographic and flexographic printing stations for depositing lithographic and flexographic inks, coatings and slurries on said substrate, whereby said lithographic and flexographic inks, coatings or slurries may be printed successively on one or both sides of said substrate in the continuous in-line process.

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF TEXAS
DALLAS DIVISION

PRINTING RESEARCH, INC., and HOWARD W. DEMOORE,	§	
Plaintiffs,	§	
v.	§	**Civil Action No.**
WILLIAMSON PRINTING CORPORATION BILL L. DAVIS, and JESSE S. WILLIAMSON,	§	**3-99CV1154-D**
Defendant.	§	

ORIGINAL COMPLAINT

Plaintiffs, Printing Research, Inc. and Howard W. DeMoore (collectively "Plaintiffs"), file this Complaint against Defendants Williamson Printing Corporation, Bill L. Davis, and Jesse S. Williamson (collectively "Defendants"), and for their causes of action would show the Court the following:

PARTIES

1. Plaintiff Printing Research, Inc. ("PRI") is a corporation organized and existing under the laws of the State of Texas and has its principle place of business at 10954 Shady Trail, Dallas, Texas 75220.

2. Plaintiff Howard W. DeMoore ("DeMoore") is an individual with a business address of 10954 Shady Trail, Dallas, Texas 75220.

3. On information and belief, Defendant Williamson Printing Corporation ("WPC") is a corporation organized and existing under the laws of the State of Texas and has its principal

place of business at 6700 Denton Drive, Dallas, Texas 75235, and may be served through its registered agent at the following address:

Jerry B. Williamson
6700 Denton Drive
Dallas, Texas 75235

4. On information and belief, Defendant Bill L. Davis ("Davis") is an individual residing at 1126 Tipton Road, Irving, Texas 75060, where he may be served with service of process.

5. On information and belief, Defendant Jesse S. Williamson ("Williamson") is an individual residing at 5738 Caruth Boulevard, Dallas, Texas 75209, where he may be served with service of process.

JURISDICTION

6. This is an action arising under the patent laws of the United States (Title 35 United States Code), to correct the designation of inventorship which currently appears on United States Patent No. 5,630,363 ("the '363 patent) under 35 U.S.C. § 256 (Count I). Additionally, this action is brought to obtain relief from the infringement of the '363 patent under 35 U.S.C. § 271 (Count II), and to recover attorneys' fees for this action under 35 U.S.C. § 285 (Count VI). Subject matter jurisdiction is therefore proper in this Court under 28 U.S.C. § 1338. Venue is proper in this Court under 28 U.S.C. § 1391(b), (c) and 1400(b).

7. This Court has supplemental jurisdiction under 28 U.S.C. §1367 as to all other causes of action alleged herein (Counts III, IV, and V).

8. On information and belief, Davis and Williamson reside in this District, and WPC maintains its primary place of business in this District. Accordingly, Defendants may be served within this District and are properly subject to the personal jurisdiction of this Court.

BACKGROUND

9. DeMoore has developed, marketed, and sold innovative equipment and supplies for the printing industry for over thirty years, and currently serves as Chairman of PRI, a corporation dedicated to supply such equipment and supplies to printers across the globe.

10. During 1994 and 1995, building upon his prior work with lithographic and flexographic printing technology, DeMoore conceived and developed a single-pass printing process and apparatus having successive printing stations for selectively applying printing inks and coatings to paper and other substrates, in which one of the stations utilizes a flexographic process and at least one of the successive stations utilizes a lithographic process. DeMoore and PRI termed this new invention the "Lithoflex" system. DeMoore and PRI developed a commercial apparatus, termed a printer/coater unit, for use with existing printing presses, which would allow those printing presses to utilize the Lithoflex system. PRI is licensed under all of DeMoore's rights to the inventions represented by the Lithoflex system and the printer/coater unit.

11. In October of 1994, Plaintiffs tested certain flexographic coating technology using a two-color Heidelberg lithographic press (the "pilot press") located at a PRI facility. The testing produced samples (the "flexographic samples") illustrating potential applications of that technology. Soon thereafter, DeMoore conceived and began development of the Lithoflex system, in which flexographic coating technology was incorporated within a single-pass press having downstream lithographic printing stations.

12. WPC is today, and was in 1994, a provider of commercial printing services. In 1994, WPC possessed and utilized a Heidelberg CD multi-color press at its Dallas facilities (the "WPC press").

13. Plaintiffs, believing WPC to possess a press of the size and type appropriate for further development of the Lithoflex system, and believing WPC to be a potential customer of the Lithoflex system, contacted WPC through PRI employees Mr. Steve Garner ("Garner") and Mr. John Bird ("Bird") in November of 1994. Bird and Garner showed representatives of WPC the flexographic samples and briefly described DeMoore's Lithoflex system. Following the presentation, WPC expressed interest in acquiring the Lithoflex system technology for use in its own systems.

14. In late 1994 and in 1995, but well prior to August 14, 1995, PRI disclosed to WPC further details of the Lithoflex system and the printer/coater units. In December of 1994, PRI demonstrated components of the Lithoflex system to representatives of WPC, including Davis and Williamson, using PRI's pilot press.

15. PRI's disclosure of the Lithoflex system concept and technology to WPC was made under a confidentiality agreement ("the Confidentiality Agreement") between PRI and WPC, in which, in exchange for the concept and details of the Lithoflex system and the printer/coater units, WPC agreed to maintain the confidentiality of the same.

16. WPC and PRI thereafter entered into an purchase agreement ("the Purchase Agreement") whereby PRI agreed to sell several printer/coater units to WPC and install the same on WPC presses. Under the terms of the agreement, WPC would pay reduced prices for the printer/coater units and installation in exchange for allowing PRI access to WPC's presses for further testing and fine-tuning of the Lithoflex system.

17. Under the terms of the Purchase Agreement, PRI delivered a printer/coater unit to WPC on or about November 15, 1995. The printer/coater unit was installed on the first station of WPC's press for testing. Subsequent stations in the WPC press line included lithographic

printing stations. The first sheets were "Lithoflexed" on the WPC press using the printer/coater unit on December 6, 1995. The testing of the printer/coater unit on the WPC press was a success.

18. On information and belief, WPC continues to utilize DeMoore's Lithoflex system.

19. On August 14, 1995, U.S. Application Serial No. 515,097 ("the '097 application"), for a "Combined Lithographic/Flexographic Printing Apparatus and Process," was filed with the United States Patent & Trademark Office ("PTO"). The '097 application named only Davis and Williamson as inventors, and was subsequently assigned to WPC. Defendants never informed Plaintiffs of any intent by Plaintiffs to file, or that Plaintiffs did file, the '097 application. On information and belief Davis and Williamson are employees of WPC. The application issued to WPC as the '363 patent and describes and claims the Lithoflex system. The '363 patent remains assigned to WPC.

20. On information and belief, Davis and Williamson are not actual inventors of the claimed invention of the '363 patent. The Lithoflex system as invented by DeMoore and explained to WPC by PRI includes all the limitations of the claims of the '363 patent. DeMoore is therefore the sole inventor of the invention claimed in the '363 patent. On information and belief, Defendants knew throughout the prosecution of the '363 patent that DeMoore was the sole actual inventor of the claimed invention of the '363 patent, and intended to fraudulently and wrongfully deprive Plaintiffs of the benefits of DeMoore's invention.

21. The omission of DeMoore from the list of named inventors in the '097 application and the '363 patent was committed without any deceptive intent on the part of DeMoore or PRI.

22. Having successfully tested the Lithoflex system and printer/coater unit on the WPC press, PRI endeavored to market the Lithoflex system to other potential buyers. To that

end, representatives of PRI contacted Hallmark Cards, Inc. ("Hallmark") for the purpose of selling Lithoflex system components to Hallmark.

23. Negotiations between PRI and Hallmark regarding the sale of Lithoflex system components to Hallmark ensued and progressed to a point where agreement appeared eminent. Before entering a purchase order with PRI, however, Hallmark commissioned a patent infringement search to examine the propriety of Hallmark's proposed use of the Lithoflex system.

24. On information and belief, and as a result of this patent infringement search, counsel for Hallmark became aware of the '363 patent, evaluated the proposed use of the Lithoflex system in light of the '363 patent, and concluded that the proposed use would infringe the '363 patent. Upon being informed by counsel of the potential for patent infringement posed by the use of the Lithoflex system, and as a direct result of the existence of the '363 patent, Hallmark concluded that it would not purchase any Lithoflex system components from PRI.

25. In December of 1998, Hallmark informed PRI of the existence of the '363 patent, and that Hallmark would not purchase any Lithoflex system components from PRI. Hallmark further indicated to PRI at this time that Hallmark's purchasing decision was based on the existence of the '363 patent and the potential for infringement of the same.

26. Plaintiffs had no knowledge of the '097 application or of the '363 patent prior to being informed of the patent's existence by Hallmark.

27. Defendants' acquisition and WPC's ownership of the '363 patent directly resulted in the loss of prospective sales to Hallmark, by PRI, of Lithoflex system components and supplies. Defendants' acquisition and WPC's ownership of the '363 patent has further

subsequently resulted in a general inability by Plaintiffs to exploit DeMoore's Lithoflex system, including the prevention of sales of Lithoflex system components and supplies.

28. Upon information and belief, Defendants applied for and secured the issuance of the '363 patent, and WPC secured ownership of the '363 patent, with full knowledge of the nature of the exclusive rights conferred by the '363 patent, namely the exclusive right to make use or sell the claimed invention of the '363 patent.

29. Upon information and belief, Defendants applied for and secured the issuance of the '363 patent, and WPC secured ownership of the '363 patent, with full knowledge that potential users of the claimed invention of the '363 patent, including potential customers of Plaintiffs would become aware of the '363 patent, would likely forego purchases of Lithoflex system components or supplies from Plaintiffs.

30. Thus Defendants applied for and secured the issuance of the '363 patent, and WPC secured ownership of the '363 patent, with full knowledge that their actions would severly limit PRI from making, using, or selling the claimed invention of the '363 patent, and that their actions could thereby cause Plaintiffs to lose prospective sales of Lithoflex system components and supplies.

30. On information and belief, Defendants intended their acquisition and ownership of the '363 patent to prevent Plaintiffs from selling Lithoflex system components and supplies.

COUNT I

CORRECTION OF INVENTORSHIP

31. Plaintiffs repeat the allegations of Paragraphs 9-30 above.

32. The '097 application and the '363 patent incorrectly omit DeMoore as an inventor of the methods or apparatus claimed therein. The '097 application and the '363 patent further

incorrectly list Davis and Williamson as inventors of the methods and apparatus claimed therein, despite the fact that neither Davis nor Williamson is a sole or joint inventor of any method or apparatus so claimed. DeMoore is the sole inventor of all methods and apparatus claimed in the '097 application and '363 patent. The omission of DeMoore from the list of inventors designated in the '097 application and the '363 patent arose without any deceptive intent on the part of DeMoore.

33. The PTO, through the Commissioner, is empowered to correct inventorship errors, including misjoinder, where error lists a person who is not an inventor, and nonjoinder, where error fails to list a person who is an inventor. Independently, under Title 35, United States Code, § 256, the federal courts and thus this Court may, on notice and hearing of all parties concerned, determine the inventorship of any patent and make corrections as appropriate. This Court may correct errors of misjoinder without regard to the existence of deceptive intent with respect to the error by either the misjoined person or the actual inventors. This Court may correct errors of nonjoinder only where there was no deceptive intent with respect to the error on the part of the nonjoined actual inventor.

34. Concurrent with the filing of this action, Plaintiffs have notified each person and entity believed to be affected by Plaintiffs" claim that the designation of inventorship of the '363 patent is incorrect. Such persons include the currently designated inventors of the '363 patent, Davis and Williamson, and the assignee of Davis's and Williamson's rights to the '363 patent, WPC. Each such person or entity is in fact a named defendant in this suit and has been provided with a copy of this pleading.

35. Pursuant to Title 35, United States Code, § 256, Plaintiffs request the Court, after an appropriate hearing, to order correction of inventorship of the '363 patent. Plaintiffs

specifically request that the Court remove Davis and Williamson as named inventors for the '363 patent, and add DeMoore as the sole actual inventor for the '363 patent. In the alternative, Plaintiffs specifically request that the Court add DeMoore as a joint inventor for the '363 patent, if the Court determines that DeMoore is a co-inventor of the subject matter claimed in the '363 patent.

COUNT II

PATENT INFRINGEMENT

36. Plaintiffs repeat the allegations of Paragraphs 9 – 30 and 32-35 above.

37. DeMoore is the actual sole inventor of the claimed invention of the '363 patent, and as such is equitable title holder to the '363 patent with standing to sue for infringement of the '363 patent.

38. Davis and Williamson are not actual inventors of the '363 patent and possess no rights under the '363 patent. The assignment of Davis's and Williamson's "rights" under the '363 patent to WPC therefore conveys no actual rights under the '363 patent to WPC. Specifically, WPC possess no right to make, use, or sell the claimed invention of the '363 patent.

39. Upon information and belief, WPC has used and continues to use the claimed methods and apparatus of the '363 patent in its printing operations in this judicial district and elsewhere.

40. Upon information and belief, WPC's use of the claimed methods and apparatus of the '363 patent in its printing operations constitutes infringement in violation of 35 U.S.C. § 271 and Plaintiffs" exclusive rights under the '363 patent.

41. On information and belief, WPC will continue to engage in acts of infringement unless permanently enjoined by this Court.

42. The infringement of the '363 patent by WPC has caused irreparable injury to Plaintiffs and will continue to cause irreparable injury to Plaintiffs unless WPC is permanently enjoined by this Court.

43. The infringement of the '363 patent by WPC has caused and continues to cause damage to Plaintiff, including impairment of the value of the '363 patent and lost sales and profits in an amount yet to be determined.

44. On information and belief, WPC's infringement of the '363 patent in this judicial district and elsewhere has been and continues to be willful.

COUNT III

CONVERSION

45. Plaintiffs repeat the allegations of Paragraphs 9-30, 32-35, and 37-44 above.

46. DeMoore is the actual sole inventor of the methods and apparatus claimed in the '363 patent, and as such, on May 20, 1997, the date of issue of the '363 patent, DeMoore held equitable title to the patent rights associated with that invention.

47. On May 20, 1997, in the City of Dallas, Dallas County, Texas, Defendants unlawfully and without authority assumed dominion and control over DeMoore's property, which is described in Paragraph 46, to the exclusion of DeMoore's rights in this property, in that on that date the '363 patent issued to Defendants. Defendants thus assumed the exclusive right to make, use, or sell the claimed invention of the '363 patent, thereby preventing DeMoore or his licensees from enjoying any benefits of DeMoore's invention.

48. The value of the property at the time and place of the conversion was in excess of $ 450,000, for which sum Plaintiffs sue.

49. Plaintiffs are entitled to interest on the sum of $ 450,000 from May 20, 1997, at the prejudgment rate of interest.

50. Defendants' conversion of claimed invention of the '363 patent, as alleged above, was fraudulent in that the conversion was accomplished through affirmative misrepresentations of the inventorship of the claimed methods and apparatus, made by Defendants to the PTO during the application for and prosecution of the '363 patent, with full knowledge of the inaccuracy of those statements and to the detriment of DeMoore, the actual inventor of the invention. Accordingly, Plaintiffs ask that exemplary damages be awarded against the Defendants.

COUNT IV

TORTIOUS INTERFERENCE WITH PROSPECTIVE BUSINESS RELATIONS

51. Plaintiffs repeat the allegations of Paragraphs 9-30, 32-35, 37-44, and 46-50 above.

52. Defendants obtained the '363 patent, knowing that DeMoore was in fact the sole actual inventor of the methods and apparatus claimed therein, and knowing and intending that these actions could prevent Plaintiffs from exploiting the claimed invention of the '363 patent through the sale of Lithoflex system components and supplies.

53. In 1998, Plaintiffs and Hallmark agreed in principle, pending the completion of a patent infringement study, to a purchase order in which Plaintiffs would sell Lithoflex system components and supplies to Hallmark.

54. A Hallmark patent infringement study revealed the existence of the '363 patent to Hallmark.

55. Hallmark subsequently chose not to agree to the purchase order, based upon a fear of potential liability for infringement of the '363 patent.

56. Plaintiffs lost its prospective purchase order with Hallmark as a result of Defendants' acquisition of WPC's ownership of the '363 patent. There is more than a reasonable probability that Plaintiffs would have obtained the purchase order in the absence of Defendants' actions.

57. Defendants' actions in obtaining the '363 patent, as alleged above, were fraudulent in that the acquisition of the '363 patent was accomplished through affirmative misrepresentations of the inventorship of the claimed methods and apparatus, made by Defendants to the PTO during the application for and prosecution of the '363 patent, with full knowledge of the inaccuracy of those statements and to the detriment of DeMoore, the actual inventor of the invention. Accordingly, Plaintiffs ask that exemplary damages be awarded against the Defendants.

58. Defendants' interference with Plaintiffs' prospective business contract with Hallmark has caused damage to Plaintiffs, including specifically by depriving Plaintiffs of profits that they would otherwise have received under the contract. Defendants' interference with Plaintiffs' prospective business contracts continues by preventing additional sales of Lithoflex components and supplies to Hallmark and other third parties.

COUNT V

BREACH OF CONTRACT

59. Plaintiffs repeat the allegations of Paragraphs 9-30, 32-35, 37-44, 46-50, and 51-58 above.

60. In 1995, and well prior to August 14, 1995, representatives of PRI and WPC agreed that, in exchange for the disclosure by PRI, to WPC, of the details of Plaintiffs' Lithoflex system and printer/coater units, WPC would maintain the confidentiality of those details.

61. PRI subsequently disclosed the details of Plaintiffs' Lithoflex system and printer/coater units, and has fully performed its obligations under the agreement.

62. WPC breached the contract described in Paragraph 60 and breached its position of trust and confidence, when Defendants surreptitiously filed the '097 patent, thus disclosing the details of the Lithoflex system and printer/coater units to the PTO, and ensuring the disclosure of the details to the public at large upon issuance of any patent therefrom. The details were disclosed to the public, in further breach of the agreement, by the issuance of the '363 patent on May 20, 1997.

63. As a result of WPC's breach of contract and breach of trust and confidence, Plaintiffs have suffered damages. In particular, Plaitiffs have suffered consequential damages, in that WPC's disclosure of the details to the PTO and the public has created a prior art reference which serves as an potential barrier against the acquisition of additional patent protection by Plaintiffs, the monetary value of which is to be determined at trial.

COUNT VI

ATTORNEYS' FEES

64. Plaintiffs repeat the allegations of Paragraphs 9-30, 32-35, 37-44, 46-50, 51-58, and 60-63 above.

65. This is an exceptional case within the meaning of 35 U.S.C. § 285. Accordingly, Plaintiffs ask that they be awarded, and that Defendants be made to compensate Plaintiffs for, Plaintiffs' reasonable attorneys' fees.

PRAYER

WHEREFORE, Plaintiffs prays for the entry herein of a final judgment:

(a) correcting the inventorship of the '363 patent, pursuant to 35 U.S.C. § 256, by removing Davis and Williamson as inventors of the invention of the '363 patent and naming DeMoore sole inventor of the claimed invention of the '363 patent or, in the alternative, by naming DeMoore a joint inventor of the claimed invention of the '363 patent;

(b) holding the '363 patent infringed by WPC;

(c) enjoining WPC and its servants, agents, officers and employees and any and all persons acting by or under WPC's authority, or in privity therewith, from engaging in further acts of infringement of the '363 patent;

(d) requiring WPC to account to Plaintiffs for any and all profits derived by WPC, and to compensate Plaintiffs under 35 U.S.C. § 284 for all damages, including lost profits, sustained by Plaintiffs due to WPC's acts of infringement of the '363 patent, together with interest, and that such damages be trebled by reason of the willful and deliberate nature of WPC's infringement;

(e) requiring Defendants to pay the costs of this suit, including, as this is an exceptional case pursuant to 35 U.S.C. § 285, Plaintiffs' reasonable attorneys' fees incurred in bringing and prosecuting its patent claims;

(f) requiring Defendants to compensate Plaintiffs for all damages sustained by Plaintiffs as a result of Defendants' conversion of Plaintiffs' rights to the invention claimed in the '363 patent, including pre- and post-judgment interest and exemplary damages, the amount of which are to be determined at trial;

(g) requiring Defendants to compensate Plaintiffs for all damages sustained by Plaintiffs as a result of Defendants' tortious interference with Plaintiffs' prospective business relations, including pre- and post-judgment interest and exemplary damages, the amount of which are to be determined at trial;

(h) requiring WPC to compensate Plaintiffs for all damages sustained by Plaintiffs as a result of WPC's breach of the Confidentiality Agreement, including pre- and post-judgment interest;

(i) that Plaintiffs be awarded all other such relief as the court may find equitable.

Respectfully submitted:

William D. Harris, Jr.
State Bar #: 09109000
L. Dan Tucker
State Bar #: 20276500
Robert T. Mowrey
State Bar #: 14607500
W. Edward Woodson
State Bar #: 24003207
LOCKE LIDDELL & SAPP LLP
2200 Ross Avenue, Suite 2200
Dallas, Texas 75201-6776

ATTORNEYS FOR PLAINTIFFS

EXCLUSIVE LICENSE

This Exclusive License is granted effective as of March 11th, 1991, by BIROW, INC., a Connecticut corporation ("Licensor") having its principal place of business at 8 Clover Lane, Westport, Connecticut 06880, to PRINTING RESEARCH, INC., a Texas corporation ("Licensee") having its principal place of business at 10954 Shady Trail, Dallas, Texas 75220.

WHEREAS, Licensor is the owner of record of the following:

(1) United States Letters Patent No. 4,796,556, Adjustable Coating and Printing Apparatus by John W. Bird issued June 27, 1989; and

(2) United States Letters Patent No. 4,841,903, Coating and Printing Apparatus Including an Interstation Dryer by John W. Bird issued June 27, 1989; and

(3) United States Letters Patent No. 4,895,070, Liquid Transfer Assembly Method by John W. Bird issued January 23, 1990; and

(4) United States Letters Patent No. 4,939,992, Flexographic Coating and/or Printing Method and Apparatus Including Interstation Driers by John W. Bird issued June 10, 1990; and

(5) Application for United States Letters Patent filed in the U.S. Patent and Trademark Office on April 11, 1989, under U.S. Serial No. 07/336435 with respect to Printing Method and Apparatus Including Interstation Drying by John W. Bird;

WHEREAS, Licensee desires to obtain the exclusive right and license to make, use and sell products covered by such Letters Patents and Application for Letters Patent;

NOW, THEREFORE, in consideration of the sum of Ten Dollars ($10.00) and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Licensor hereby

08050"96/25150

005674 FRAME 490

grants to Licensee the exclusive, irrevocable, worldwide right and license to make, have made, use, manufacture, market, sell, sublicense, lease and otherwise dispose of any and all products, apparatus, devices, equipment, implements, mechanisms, assemblies, methods, techniques, patterns, procedures, routines and systems covered by the aforementioned Letters Patent and Application for Letters Patent.

Licensor represents and warrants that it has not granted and will not grant to others any rights inconsistent with the rights granted herein, and that said Letters Patents and Application for Letters Patent are free and clear of all encumbrances and liens.

IN WITNESS WHEREOF, Licensor has executed this Exclusive License on the date first above written.

LICENSOR:

BIROW, INC.

By: _____
Name: John W. Bird
Title: President

By: _____
Name: Thomas A. Rowley
Title: Secretary

RECORDED
PATENT AND TRADEMARK
OFFICE
APR 25 1991

STATE OF TEXAS §
§ ss.
COUNTY OF DALLAS §

On this 12th day of March, in the year of 1991, before me personally appeared JOHN W. BIRD, personally known to me or proved to me on the basis of satisfactory evidence to be the person who executed the written instrument as President of the corporation therein named, and acknowledged to me that the corporation executed it pursuant to its bylaws or a resolution of its board of directors.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year in this certificate first above written.

Linda Nottingham

Name (Print): LINDA NOTTINGHAM
Notary Public, State of Texas
My commission expires: 4/21/92

LINDA NOTTINGHAM
Notary Public, State of Texas
My Commission Expires 4/21/92

REEL 5674 FRAME 492

STATE OF CONNECTICUT §
§ ss. WESTPORT
COUNTY OF FAIRFIELD §

On this 9th day of March, in the year of 1991, before me personally appeared THOMAS A. ROWLEY, personally known to me or proved to me on the basis of satisfactory evidence to be the person who executed the written instrument as Secretary of the corporation therein named, and acknowledged to me that the corporation executed it pursuant to its bylaws or a resolution of its board of directors.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year in this certificate first above written.

Name (Print): __________
Notary Public, State of Connecticut
My commission expires: __________

VIRGINA M. LANGE
Notary Public
My Commission Expires March 31, 1994

Printing Research, Inc.
"Mark-less" Super Blue®

June 25, 1993

Mr. Bill Davis
Williamson Printing
PO Box 36622
6700 Denton Drive
Dallas TX 75235

214-904-2100 (Phone)

Dear Bill,

It was a great pleasure meeting with you and Bob Emrick. We have enclosed product information and the following **Super Blue** proposal for installation on your:

Package 1 A. **Komori Lithrone**, 6 color, 40 inch press
B. **Komori Lithrone**, 6 color, 40 inch press
C. **OMCSA**, 6 color, 40 inch press
D. **OMCSA**, 5 color, 40 inch press

- A **Super Blue** anti-marking system for installation at each of the wet transfers.

Package 2 A, B, C & D presses as above
A & B
- A **Super Blue** anti-marking system for installation at the wet transfers.
- A **Super Blue** BV BacVac Delivery Vacuum Transfer System for installation at the delivery transfer.

C & D
- A **Super Blue** anti-marking system for installation at the wet transfers.

Package 3 **Komori Lithrone**, 6 color, 40 inch press
- A **Super Blue** PBC Plate/Blanket Coater for installation at the last printing unit.
- A **Super Blue** CII Combination II 2KW Air Knives and Exhaust Infra-Red Drying System for installation in the delivery.
- A **Super Blue** CUV 'Cold' UV Drying System for installation in the delivery.
- A **Super Blue** Vent-A-Hood System for installation on the delivery.
- A **Super Blue** HV High Velocity Hot Air Drying System for installation between printing units.

10954 Shady Trail Dallas, Texas 75220 U.S.A. Telephone 214-353-9000 Telex 794028 Superblue dal Fax 214-357-5847

Package 4 **OMCSA**, 2 color, 40 inch press

- A **Super Blue** PBC Plate/Blanket Coater on printing units one and for installation at the last printing unit.
- A **Super Blue** BV BacVac Delivery Vacuum Transfer System for installation between printing units and at the delivery transfer.
- A **Super Blue** HV High Velocity Hot Air Drying System for installation between printing units and in the delivery.
- A **Super Blue** CUV 'Cold' UV Drying System for installation in the delivery.
- A **Super Blue** Vent-A-Hood System for installation on the delivery.

Package 5 **Komori Lithrone**, 6 color, 40 inch press

- A **Super Blue** HV High Velocity Hot Air Drying System for installation between printing units.

We look forward to serving your needs and thank you for your interest in our **Super Blue** range of products.

Sincerely yours,

John Bird
Product Manager

JB:nw

Enclosure

cc: Bob Emrick - Williamson Printing
Steve Baker

Printing Research, Inc.
"Mark-less" Super Blue®

Williamson Printing
June 25, 1993

SUMMARY OF PROPOSAL
for
PACKAGE 1

QTY	EQUIPMENT	UNIT PRICE	EXTENSION
	A. KOMORI LITHRONE 6 COLOR, 40 INCH		
6	SUPER BLUE DOUBLE SIZE TRANSFER/DELIVERY KITS	$ 1,100.	$ 6,600.
	B. KOMORI LITHRONE 6 COLOR, 40 INCH		
6	SUPER BLUE DOUBLE SIZE TRANSFER/DELIVERY KITS	1,100.	6,600.
	C. OMCSA 6 COLOR, 40 INCH		
8	SUPER BLUE DOUBLE SIZE TRANSFER/DELIVERY KITS	1,100.	8,800.
	D. OMCSA 5 COLOR, 40 INCH		
6	SUPER BLUE DOUBLE SIZE TRANSFER/DELIVERY KITS	1,100.	6,600.
	TOTAL EQUIPMENT (FOB Factory)		**$28,600.**

FREIGHT PREPAID AND ADDED TO INVOICE, INSTALLATION AND TRAINING CHARGED AT $575. PER DAY PER MAN PLUS AIRFARES

QTY	RECOMMENDED SPARE PARTS	UNIT PRICE	EXTENSION
1	NONE REQUIRED		

PROPOSAL, TERMS AND CONDITIONS OF SALE ON REVERSE SIDE ACCEPTED BY:

NAME _____

TITLE _____

SIGNATURE _____

DATE _____

10954 Shady Trail Dallas, Texas 75220 U.S.A. Telephone 214-353-9000 Telex 794028 Superblue dal Fax 214-357-5847

Printing Research, Inc.
"Mark-less" Super Blue®

SB 093988
Williamson Printing
June 25, 1993

PROPOSAL

SUPER BLUE ANTI-MARKING SYSTEM
PACKAGE 1

QTY	EQUIPMENT		UNIT PRICE	EXTENTION
	A. KOMORI LITHRONE, 6 COLOR, 40 INCH			
6	Double Size Transfer/Delivery Kits	@	$1,100.	**$ 6,600.**
	B. KOMORI LITHRONE, 6 COLOR, 40 INCH			
6	Double Size Transfer/Delivery Kits	@	$1,100.	**$ 6,600.**
	C. OMCSA, 6 COLOR, 40 INCH			
8	Double Size Transfer/Delivery Kits	@	$1,100.	**$ 8,800.**
	D. OMCSA, 5 COLOR, 40 INCH			
6	Double Size Transfer/Delivery Kits	@	$1,100.	**$ 6,600.**
	TRAINING AND INSTALLATION: (PER MAN/PER DAY PLUS AIRFARE)			$ 575.

Training and installation prices are based on performing work between 6:00 am and 6:00 pm. Work scheduled to begin other than between those times or on weekends is subject to a premium charge above the quoted price for training and installation.

PAYMENT TERMS AND/OR SPECIAL NOTATIONS:

30-day money back guarantee when training and installation is provided by Printing Research, Inc.

Terms are 1/3 prior to shipment, balance due in two equal payments 30 and 60 days after shipment with approved credit. Extended payment Program available to qualified participants offering below-market interest rate.

Prices and terms quoted above are valid for 60 days from the date of quotation. Pricing in this quote supersedes any previous quote you may have received. All prices are FOB Dallas, TX.

We will be happy to proceed immediately upon receipt of your approval.

10954 Shady Trail Dallas, Texas 75220 U.S.A. Telephone 214-353-9000 Telex 794028 Superblue dal Fax 214-357-5847

Super Blue "Wash-Free" Anti-Marking System

FEATURES	ADVANTAGES	BENEFITS
✪ Top grade machined aluminum delivery cylinder with frictionless cylinder surface to which is attached a movable ink and water repellant net covering preventing paper, water and ink from contacting with cylinder surface	✪ Virtually eliminates all marking	✪ Reduces paper waste and cost
	✪ Eliminates skeleton wheels and all associated systems, and adjustments i.e. star bars, bird cage arrangements	✪ Full ink coverage even on coated stock
	✪ Skeleton wheel adjustments are no longer necessary	✪ Increased profitability and productivity
	✪ Avoids running oversized sheets for wheel placement	
	✪ Full cylinder gives better support to printed sheet	
	✪ Prevents re-stripping of jobs in order to have a place to run wheels	
	✪ Eliminates the need to run a wheel in the center of the sheet	
	✪ Press can be operated at maximum speeds	✪ Non-stop production with optimum profits
	✪ More creative in layout (allows nesting), with no limitations	✪ Expanded customer base with paper savings
✪ A frictionless base cover placed on transfer drums to which is attached a movable, ink and water repellant net covering preventing paper, water and ink from contacting with cylinder surface.	✪ Virtually eliminates all marking	✪ Reduces paper waste and cost
	✪ Reduces makeready	
	✪ Eliminates all transfer drum washing	✪ Increased profitability and productivity
	✪ Aids in transferring difficult stock from unit to unit	✪ Increased print flexibility
✪ Velcro mounting borders	✪ Quick and simple net replacement	✪ Minimized installation error
✪ "Wash-free" nets and maintenance free base covers	✪ Near perfect total maintenance free system	✪ Increased productivity and profitability
✪ Less than six month return on investment	✪ Sales force can sell benefits of "Mark-less" printing	✪ Excellent investment which yields more competitive pricing and expanded capabilities
✪ Guaranteed to perform	✪ 30 day money back guarantee	✪ Risk free
	✪ Endorsed by major press manufacturers	
	✪ Over 100,000 cylinders sold	✪ Peace of mind
✪ Complete training of staff by PRI professionals (Including complete Instructions)	✪ Knowledgeable operators at completion of installation and training	✪ Increased productivity due to responsive training program by PRI
		✪ Ability to produce saleable sheets immediately after training

Printing Research, Inc.
"Mark-less" Super Blue®

Williamson Printing
June 25, 1993

SUMMARY OF PROPOSAL

for

PACKAGE 2

QTY	EQUIPMENT	UNIT PRICE	EXTENSION
	A. KOMORI LITHRONE 6 COLOR, 40 INCH		
1	SUPER BLUE BACVAC VACUUM DELIVERY SYSTEM (BV)	$ 11,611.	$ 11,611.
5	SUPER BLUE DOUBLE SIZE TRANSFER KITS	1,100.	5,500.
	B. KOMORI LITHRONE 6 COLOR, 40 INCH		
1	SUPER BLUE BACVAC VACUUM DELIVERY SYSTEM (BV)	11,611.	11,611.
5	SUPER BLUE DOUBLE SIZE TRANSFER KITS	1,100.	5,500.
	C. OMCSA 6 COLOR, 40 INCH		
8	SUPER BLUE DOUBLE SIZE TRANSFER KITS	1,100.	8,800.
	D. OMCSA 5 COLOR, 40 INC		
6	SUPER BLUE DOUBLE SIZE TRANSFER KITS	1,100.	6,600.
	TOTAL EQUIPMENT (FOB Factory)		**$49,622.**

FOB Factory

FREIGHT PREPAID AND ADDED TO INVOICE, INSTALLATION AND TRAINING CHARGED AT $575. PER DAY PER MAN PLUS AIRFARES

QTY	RECOMMENDED SPARE PARTS	UNIT PRICE	EXTENSION
1	NONE REQUIRED		

PROPOSAL, TERMS AND CONDITIONS OF SALE ON REVERSE SIDE ACCEPTED BY:

NAME _____

TITLE _____

SIGNATURE _____

DATE _____

10954 Shady Trail Dallas, Texas 75220 U.S.A. Telephone 214-353-9000 Telex 794028 Superblue dal Fax 214-357-5847

Printing Research, Inc.
"Mark-less" Super Blue®

SB 093988
Williamson Printing
June 25, 1993

PROPOSAL

SUPER BLUE ANTI-MARKING SYSTEM
PACKAGE 2

QTY	EQUIPMENT		UNIT PRICE	EXTENTION
	A. KOMORI LITHRONE, 6 COLOR, 40 INCH			
5	Double Size Transfer Kits	@	$ 1,100.	**$ 5,500.**
	B. KOMORI LITHRONE, 6 COLOR,40 INCH			
5	Double Size Transfer Kits	@	$ 1,100.	**$ 5,500.**
	C. OMCSA, 6 COLOR, 40 INCH			
8	Double Size Transfer Kits	@	$ 1,100.	**$ 8,800.**
	D. OMCSA, 5 COLOR, 40 INCH			
6	Double Size Transfer Kits	@	$ 1,000.	**$ 6,600.**
	TRAINING AND INSTALLATION: (PER MAN/PER DAY PLUS AIRFARE)			$ 575.

Training and installation prices are based on performing work between 6:00 am and 6:00 pm. Work scheduled to begin other than between those times or on weekends is subject to a premium charge above the quoted price for training and installation.

PAYMENT TERMS AND/OR SPECIAL NOTATIONS:

30-day money back guarantee when training and installation is provided by Printing Research, Inc.

Terms are 1/3 prior to shipment, balance due in two equal payments 30 and 60 days after shipment with approved credit. Extended payment Program available to qualified participants offering below-market interest rate.

Prices and terms quoted above are valid for 60 days from the date of quotation. Pricing in this quote supersedes any previous quote you may have received. All prices are FOB Dallas, TX. We will be happy to proceed immediately upon receipt of your approval.

10954 Shady Trail Dallas, Texas 75220 U.S.A. Telephone 214-353-9000 Telex 794028 Superblue dal Fax 214-357-5847

Super Blue "Wash-Free" Anti-Marking System

FEATURES	ADVANTAGES	BENEFITS
✪ Top grade machined aluminum delivery cylinder with frictionless cylinder surface to which is attached a movable ink and water repellant net covering preventing paper, water and ink from contacting with cylinder surface	✪ Virtually eliminates all marking	✪ Reduces paper waste and cost
	✪ Eliminates skeleton wheels and all associated systems, and adjustments i.e. star bars, bird cage arrangements	✪ Full ink coverage even on coated stock
	✪ Skeleton wheel adjustments are no longer necessary	✪ Increased profitability and productivity
	✪ Avoids running oversized sheets for wheel placement	
	✪ Full cylinder gives better support to printed sheet	
	✪ Prevents re-stripping of jobs in order to have a place to run wheels	
	✪ Eliminates the need to run a wheel in the center of the sheet	
	✪ Press can be operated at maximum speeds	✪ Non-stop production with optimum profits
	✪ More creative in layout (allows nesting), with no limitations	✪ Expanded customer base with paper savings
✪ A frictionless base cover placed on transfer drums to which is attached a movable, ink and water repellant net covering preventing paper, water and ink from contacting with cylinder surface.	✪ Virtually eliminates all marking	✪ Reduces paper waste and cost
	✪ Reduces makeready	
	✪ Eliminates all transfer drum washing	✪ Increased profitability and productivity
	✪ Aids in transferring difficult stock from unit to unit	✪ Increased print flexibility
✪ Velcro mounting borders	✪ Quick and simple net replacement	✪ Minimized installation error
✪ "Wash-free" nets and maintenance free base covers	✪ Near perfect total maintenance free system	✪ Increased productivity and profitability
✪ Less than six month return on investment	✪ Sales force can sell benefits of "Mark-less" printing	✪ Excellent investment which yields more competitive pricing and expanded capabilities
✪ Guaranteed to perform	✪ 30 day money back guarantee	✪ Risk free
	✪ Endorsed by major press manufacturers	
	✪ Over 100,000 cylinders sold	✪ Peace of mind
✪ Complete training of staff by PRI professionals (Including complete Instructions)	✪ Knowledgeable operators at completion of installation and training	✪ Increased productivity due to responsive training program by PRI
		✪ Ability to produce saleable sheets immediately after training

Printing Research, Inc.
"Mark-less" Super Blue®

BV 093988
Williamson Printing
June 25, 1993

PROPOSAL

PACKAGE 2

SUPER BLUE BACVAC DELIVERY VACUUM TRANSFER SYSTEM

QTY	PRESS	PRICE
	A. KOMORI LITHRONE, 6 COLOR, 40 INCH	
1	BacVac Vacuum Delivery System	$ 11,611.
	B. KOMORI LITHRONE, 6 COLOR, 40 INCH	
1	BacVac Vacuum Delivery System	$ 11,611.

PURPOSE

- Optimized press speeds with minimal risk of marking varnish, water based or U.V. coatings.
- Stop unnecessary delivery wheel makeready.
- Eliminate starwheel and stop press adjustments.

APPLICATION

Paper, Card, Carton Board, Plastic, Foil

CONFIGURATION

A vacuum transfer system which eliminates marking completely for sheet fed presses. The press grippers pull the sheet, dry side against the BACVAC rollers, which are contoured to the original cylinder path. The vacuum holds the sheets against the rollers, ensuring that the printed and or coated side of the sheet does not come into contact with any surface whatsoever.

Enclosures: Sales Terms
Features Table

10954 Shady Trail Dallas, Texas 75220 U.S.A. Telephone 214-353-9000 Telex 794028 Superblue dal Fax 214-357-5847

Super Blue BacVac

FEATURES	ADVANTAGES	BENEFITS
✪ Vacuum Transfer System with frictionless free wheeling roller support	✪ Assures markfree printed or coated sheets at delivery transfer	✪ Optimized press speed assures higher productivity and profitability.
	✪ Provides ability to print or coat any thickness or grain direction of stock.	✪ Creates total flexibility in choice of stock
	✪ Any stock adheres to vacuum transfer at full press speeds	✪ Guaranteed quality of heavy ink coverage, varnished or coated work. ✪ Reduced spoilage and over runs
	✪ Decreases need to purchase special stock	✪ Provides added value to finished sheets
	✪ Non-printed or non-coated side of sheet is held by vacuum to the contour of the BacVac rollers	✪ Maximizes ink, varnish or coating applications without marking
	✪ Printed or coated side of sheet does not make contact with any surface	✪ Full coverage without scratching or marking.
	✪ Fully automatic, maintenance free, no adjustments	✪ Eliminates make ready down time at delivery transfer increasing productivity and profitability
	✪ No special tools, no stop press adjustments, no delivery adjustments necessary	
✪ Energy efficient vacuum motor	✪ Continuous controlled air flow	✪ Low cost energy consumption
✪ Automatic on/off	✪ No adjustments necessary	
✪ Complete training of staff by PRI professionals (Including complete Operator's and Pre-Installation Manuals)	✪ Knowledgeable operators at completion of installation and training	✪ Increased productivity due to responsive training program by PRI ✪ Ability to produce saleable sheets immediately after training.

Printing Research, Inc.

"Mark-less" Super Blue®

Williamson Printing
June 25, 1993

SUMMARY OF PROPOSAL
for
PACKAGE 3
KOMORI LITHRONE 6 / 40

	QTY	EQUIPMENT	UNIT PRICE	EXTENSION
A	1	SUPER BLUE PLATE BLANKET COATER (PBC)	$ 76,530.	$ 76,530.
B	1	SUPER BLUE COMBINATION II 2KW AIR KNIVES EXHAUST IR DRYER (CII)	30,770.	30,770.
C	1	SUPER BLUE THREE LAMP 'COLD' UV DRYING SYSTEM (CUV)	87,806.	87,806.
D	1	SUPER BLUE VENT-A-HOOD EXHAUST SYSTEM (VH)	4,000.	4,000.
E	1	SUPER BLUE HIGH VELOCITY HOT AIR DRYING SYSTEM (HV)	39,992.	39,992.
		TOTAL EQUIPMENT (FOB Factory)		**$239,098.**

FREIGHT PREPAID AND ADDED TO INVOICE, INSTALLATION AND TRAINING CHARGED AT $575. PER DAY PER MAN PLUS AIRFARES

	QTY	RECOMMENDED SPARE PARTS	UNIT PRICE	EXTENSION
A	1	SPARE APPLICATOR ROLL (per inch)	70.	$ 2,800.
	1	SPARE METERING ROLL (per inch)	45.	1,800.
B	1	SPARE BOX OF LAMPS (10 per box)	104.	1,040.
C	3	SPARE U.V. LAMPS	338.	1,014.
	2	FILTER TUBES	587.	1,174.
	3	DEIONIZING RESIN CARTRIDGES	50.	150.
D/E		NONE REQUIRED		
		TOTAL RECOMMENDED SPARE PARTS		**$ 7,978.**

PROPOSAL, TERMS AND CONDITIONS OF SALE ON REVERSE SIDE ACCEPTED BY:

NAME ______________________________

TITLE ______________________________

SIGNATURE ______________________ **DATE** ______________________

Printing Research, Inc.
"Mark-less" Super Blue®

PBC 093988
Williamson Printing
June 25, 1993

PROPOSAL
PACKAGE 3

SUPER BLUE PBC PLATE AND BLANKET COATER

PRESS	COLOR/SIZE	PRICE
KOMORI LITHRONE	6 / 40	$ 76,530.

RECOMMENDED SPARE PARTS:

Spare Rolls:	Applicator (per inch)	$ 70.
	Metering (per inch)	$ 45.
Spare Pump Stand:	If intention is to run both aqueous and UV	$ 4,000.

PURPOSE

Application of aqueous or UV coatings to either the plate or blanket cylinder of a press unit, for spot or area coating with exceptional uniformity, clean edges and precise registration.

APPLICATION

Paper, Card, Carton Board, Corrugated, Plastic, Foil

CONFIGURATION

Speed control is maintained via throttling valves mounted on the control cabinet. Start/stop controls are interlocked with press controls to suit. All rolls are variable speed and are ramped to match the selected percentage of surface speed. Applicator roll normally drives slower than plate or blanket surface speed, while metering roll and pick up or pan roll are always less than the applicator. The applicator roll automatically follows the direction of the plate or blanket.

The metering and applicator rollers are rubber, while the pick up roll is chromed microfinished. The metering roll has left and right hand adjustments for on-off contact with pick-up roll and independent manual screw adjustments to set profile. Each roll has vernier indicators for gap adjustment. A stainless steel coater pan is designed for recirculation of coating via a diaphragm pump with a large diameter hose used to return the coating to a 55 gallon drum. The diaphragm pump is plumbed and is installed on a stainless steel coating drum cover incorporating a hinged plexiglass viewing window and an adjustable, audible, and visual warning system.

Enclosures: Sales Terms
Features Table

10954 Shady Trail Dallas, Texas 75220 U.S.A. Telephone 214-353-9000 Telex 794028 Superblue dal Fax 214-357-5847

Super Blue PBC Plate Blanket Coater

FEATURES	ADVANTAGES	BENEFITS
✪ Fully retractable Spot Plate or Blanket coating	✪ Ability to spot or overall coat ✪ In-line coating flexibility without dedicating the last printing unit to coating	✪ Maximum utilization of printing units
✪ Application of coating from plate cylinder	✪ Elimination of lengthy downtime due to registering coating to image ✪ Negates need to cut blankets while press down ✪ Sharp clean, crisp image definition ✪ Water-based coating can replace and surpass press varnish ✪ Coatings have higher scuff resistance than press varnish and are non-yellowing	✪ Simple precise register control ✪ Increased productivity and profitability ✪ Insurmountable quality ✪ Value added to printed sheets ✪ Increased product durability and cosmetic quality
✪ Application of coating from blanket cylinder	✪ Fast makeready since overall coating directly applied from blanket cylinder ✪ Heavy overall coating film weights easily applied ✪ Functional coatings such as remoistenable gum and blister pack coatings easily applied	✪ Increased productivity and profitability ✪ Optimizing gloss and physical properties ✪ Added value to printed work and increased product range capabilities
✪ Sheer application of coatings	✪ Uniform thickness of coating from the plate cylinder ✪ Minimizes slinging or misting of coatings ✪ Allows the widest range of viscosities to be used ✪ Water based coatings will stay open indefinitely on coater while circulating	✪ The best coating lay characteristics for optimized added value ✪ Prevents costly cleanups ✪ Optimizes gloss and physical properties ✪ Minimizes downtime through wash-ups, operators can concentrate on press operation creating higher productivity
✪ Coating pump stand with run dry protection	✪ Visual and audible warning of low coating level in barrel	✪ Complete operator awareness alert and non-stop production
✪ Complete training of staff by PRI professionals (Including complete Operator's and Pre-Installation Manuals)	✪ Knowledgeable operators at completion of installation and training ✪ Recommendation of all production consumables available for start-up.	✪ Increased productivity due to responsive training program by PRI ✪ Ability to produce saleable sheets immediately after training

Printing Research, Inc.
"Mark-less" Super Blue®

CII 093988
Williamson Printing
June 25, 1993

PROPOSAL
PACKAGE 3

SUPER BLUE COMBINATION II 2KW AIR KNIVES/EXHAUST IR DRYER

PRESS	COLOR/SIZE	MAX KW OUTPUT	PRICE
KOMORI LITHRONE	6 / 40	48	$ 30,770.

RECOMMENDED SPARE PARTS:

2KW Lamps (10 lamps per box) $ 1,040.

PURPOSE

Accelerates the drying of inks, reduces the need for spray powder, dries aqueous coatings on paper, card, corrugated and carton board.

CONFIGURATION

The unique Super Blue Combination II infra-red dryer is installed in the delivery of the press with 18 inch 2KW short wave infra-red lamps.The dryer is linked to impression of the press and automatically switches lamps off when the press is off impression and automatically switches lamps on when the press is on impression. The lamp ends are cooled with air which is ducted through airknives built into the dryer and a separate airknife is also supplied to drive moisture off the sheet surface. A separately supplied exhaust system ensures no build up of moisture within the drying area of the press. A water cooled reflector pan with a closed loop heat exchanger further protects the press and printed work. Standard control system including diagnostics and thermometer is supplied as a press mounting module.

Enclosures: Sales Terms
Features Table

10954 Shady Trail Dallas, Texas 75220 U.S.A. Telephone 214-353-9000 Telex 794028 Superblue dal Fax 214-357-5847

Super Blue Combination II Air Knives/Exhaust Infra-Red Dryer

FEATURES	ADVANTAGES	BENEFITS
✪ Combination of air knives/ exhaust and shortwave infra-red	✪ Assures accelerated drying of ink ✪ Minimizes spray powder consumption ✪ Assures drying of water based coatings ✪ Most effective in driving moisture out of ink and coating ✪ High scrubbing action of air knives makes removal of moisture laden air easily achievable ✪ Will not dry out stock, will not shrink sheet, will not cause loss of register for 2nd pass or post press operations	✪ Increases productivity and profitability ✪ Assures highest quality levels for value added
✪ Unique 18 inch 2kw short wave infra-red lamps ✪ Lamp life rated at 5000 hours and are individually replaceable	✪ Desired stack temperatures easily achieved on any stock at full press speeds ✪ 25% more energy output and 50% more dwell time than any other dryer ✪ Instantaneous on/off response - less than 1 second ✪ Longer life, less maintenance	✪ Highest possible productivity ✪ Improve lay characteristics of coatings ✪ Maximum energy efficiency ✪ Optimizes energy efficiency ✪ Improved safety. Minimal chance of fire if sheet touches lamps ✪ Cost effective, economical
✪ Water cooled (closed loop) reflector plate	✪ Prevents heat build-up of delivery pan ✪ No special plumbing needed	✪ Assures controllable stack temperature for greater efficiency. ✪ Prevents damage to press mechanisms. ✪ Prevents metal fatigue
✪ Complete training of staff by PRI professionals (Including compete Operator's and Pre-Installation Manuals)	✪ Knowledgeable operators at completion of installation and training	✪ Increased productivity due to responsive training program by PRI ✪ Ability to produce saleable sheets immediately after training

Printing Research, Inc.
"Mark-less" Super Blue®

CUV 093988
Williamson Printing
June 25, 1993

PROPOSAL
PACKAGE 3

SUPER BLUE 'COLD' UV DRYING SYSTEM

PRESS	COLOR/SIZE	LAMPS	RATING	PRICE
KOMORI LITHRONE	6 / 40	3	300 watt/inch	$ 87,806.

RECOMMENDED SPARE PARTS:

UV Lamps (each)	$338.
Filter Tubes (each)	$587.
Deionizing Resin Cartridge (each)	$ 50.

PURPOSE

Curing (drying) UV inks, varnishes or coating on sheet or web fed presses.

APPLICATION

Paper, Card, Carton Board, Corrugated, Plastic, Foil

CONFIGURATION

Curing heads are linked to impression of press and automatically switch to standby mode when press is off impression for five minutes. If no further action is taken, then lamps automatically turn off; if the press is put back into impression, the lamps automatically return to full power.

Standard Control Unit contains all necessary switchgear and controls to provide individual lamp selection, full and reduced individual power switching, elapsed life meters, lamp indicators and emergency stop button.

Main power transformer, capacitor banks and closed loop exchanger plant are supplied as floor standing modules. Full safety interlock circuits are fitted throughout. Ozone and heat extraction from the press are not normally required.

Enclosures: Sales Terms
Features Table

10954 Shady Trail Dallas, Texas 75220 U.S.A. Telephone 214-353-9000 Telex 794028 Superblue dal Fax 214-357-5847

SUPER BLUE 'COLD' UV DRYING SYSTEM

FEATURES	ADVANTAGES	BENEFITS
✪ Quartz Filter Tubes carrying deionized distilled water	✪ Allows 98-99% of the UV to pass through	✪ Maximizes curing efficiency which results in full production press speeds
	✪ Filters most of the unwanted heat	✪ Minimizes risk of fire and resultant downtime
	✪ Ensures low stack temperatures	✪ Eliminates risk of distortion of heat sensitive stock
✪ Closed Loop Deionizing chilled water system	✪ Allows complete temperature control of water recirculation system	✪ No costly losses of heating or cooling energy from the plant
✪ Low Volume Compressed Air Lamp Cooling	✪ Ensures minimal ozone production	✪ Creates a safe work place environment meeting all OSHA and EPA standards
	✪ Ensures lamp running temperatures are precise	✪ Assures optimum efficiency level of UV output
✪ Heat Exhaust System (HES) installed between printing units	✪ Reduces heat build-up created by chemical reaction of inks	✪ Eliminates expensive downtime caused by ink piling on the blankets
	✪ Reduces tack levels of ink	✪ Decreases risk of hickies and the cost of downtime to remove hickies on work and turn
	✪ Prevents heat build-up between printing units	✪ Protects press functions and operators
✪ Water cooled UV lamp head and delivery reflector pan	✪ Absorbs most of the unwanted heat	✪ Prevents risk of press damage
	✪ Prevents heat build-up of delivery stack	✪ Eliminates risk of stock distortion in stack
		✪ Decreases risk of waste sheets caused by offsetting of C2S stock when printed or coated first side
✪ Complete Training of staff by PRI professionals (Including complete Operator's and Pre-Installation Manuals)	✪ Knowledgeable operators at completion of installation and training	✪ Increased productivity due to responsive training program by PRI
		✪ Ability to produce saleable sheets immediately after training

Printing Research, Inc.
"Mark-less" Super Blue®

VH 093988
Williamson Printing
June 25, 1993

PROPOSAL
PACKAGE 3

SUPER BLUE VENT-A HOOD EXHAUST SYSTEM

PRESS	COLOR/SIZE	COATING/DRYING	PRICE
KOMORI LITHRONE	6 / 40	PBC/CII	$ 4,000.

PURPOSE

To be installed on the delivery of the press to exhaust moisture laden air, lowering the humidity within the delivery area. Reduces the need for spray powder increasing the efficiency of the existing dryer.

FEATURES

This specially designed exhaust system utilizes a high output fan with variable power speed control at the delivery of your press. The Vent-A-Hood exhaust helps minimize the build up of moisture within the drying area of the press.

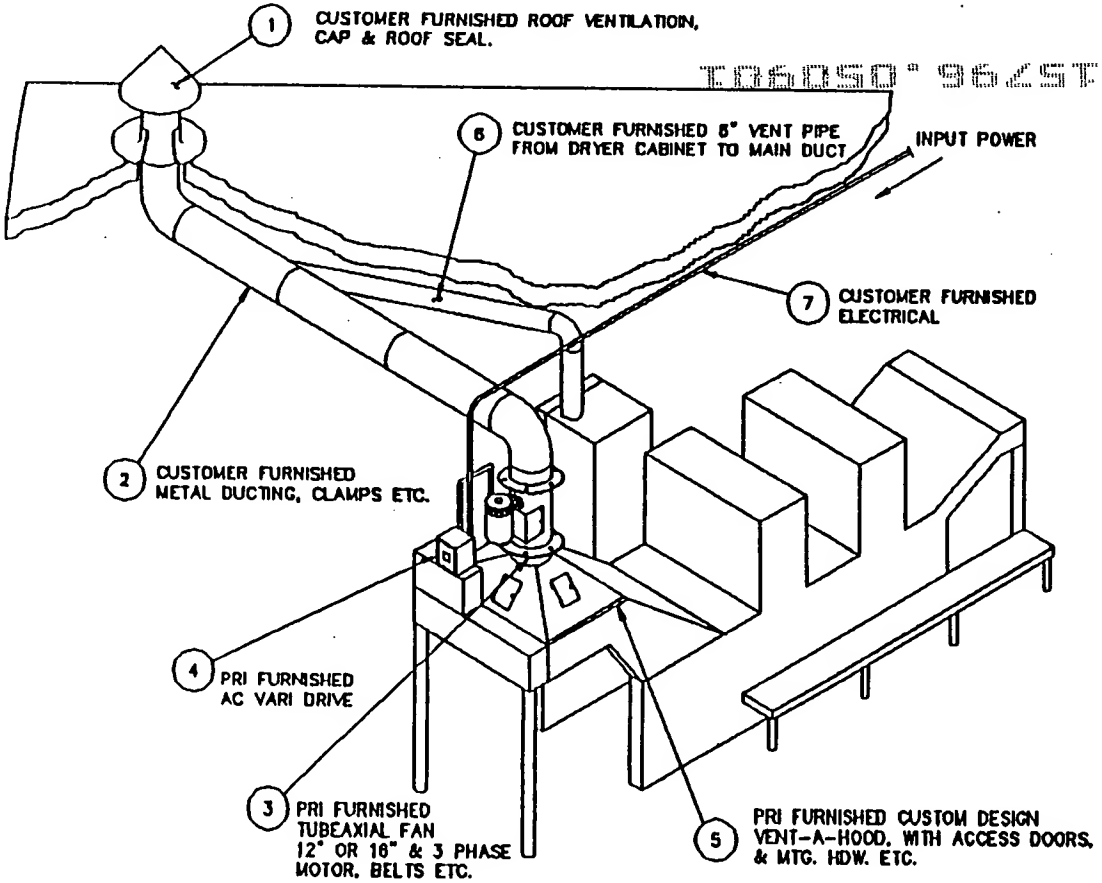
BENEFITS

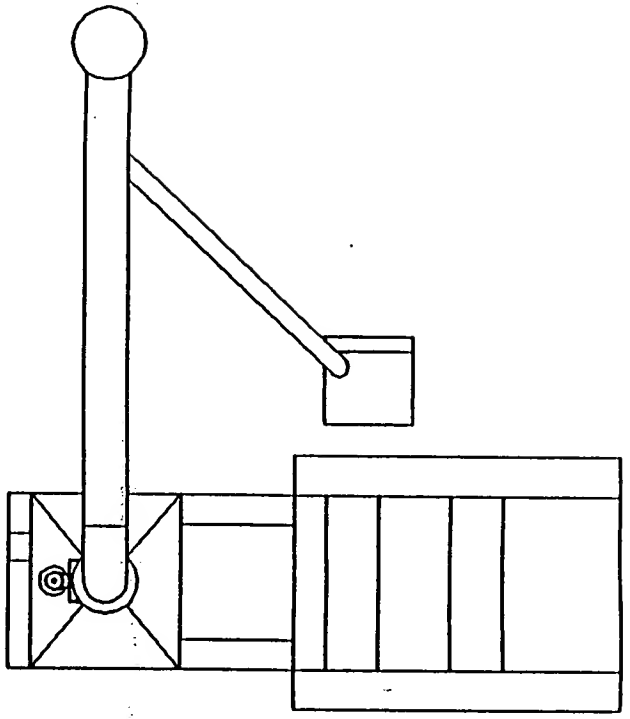
- Enhances the capabilities of your current dryer.
- Help remove excess spray powder.
- Minimizes unpleasant odors at the delivery.
- Reduces the need for spray powder.

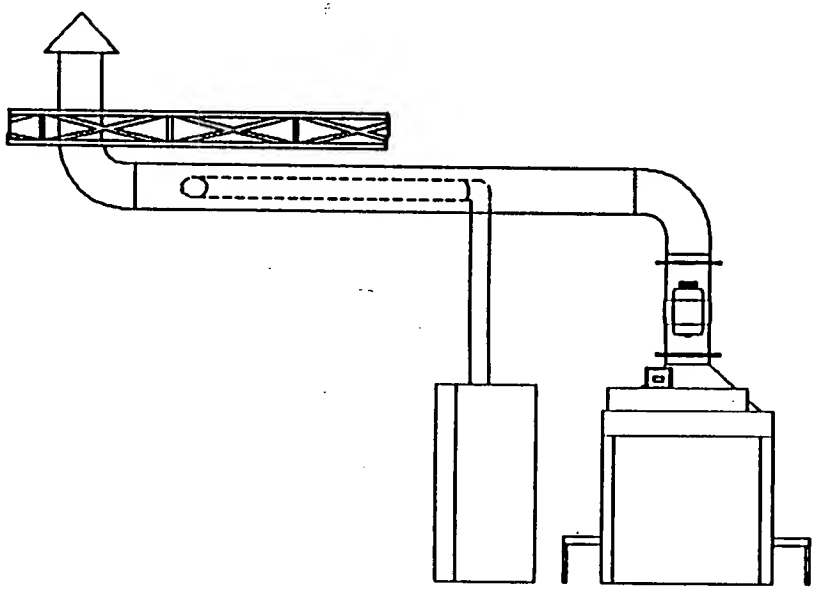
Enclosures: Sales Terms
Features Table

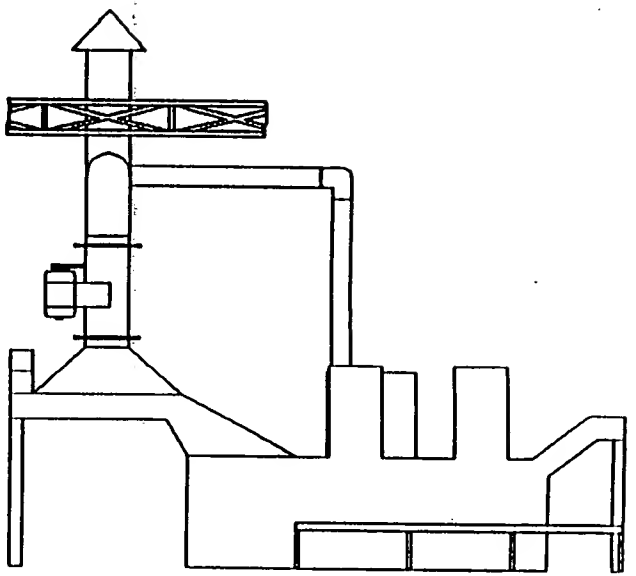
10954 Shady Trail Dallas, Texas 75220 U.S.A. Telephone 214-353-9000 Telex 794028 Superblue dal Fax 214-357-5847

TB6050" 96ASTE60









Printing Research, Inc.
"Mark-less" Super Blue®

HV 093988
Williamson Printing
June 25, 1993

PROPOSAL
PACKAGE 3

SUPER BLUE HV™ HIGH VELOCITY HOT AIR DRYING SYSTEM

PRESS	COLOR/SIZE	MAX KW OUTPUT	MAXIMUM CFM/ HEAT OUTPUT	PRICE
KOMORI LITHRONE	6 / 40	42 Per Cabinet	650/250°F Per Cabinet	$ 39,992. Per Cabinet

One HV cabinet feeding air knives and exhaust between printing units 1/2, 2/3, 5/6

PURPOSE

- Allow work and turn and post processing in minutes, not hours.
- Flashing off solvent and water in conventional inks between printing units.
- Minimize if not eliminate spray powder, when coating.
- Minimizing gloss back or dry back when coating.
- Enhancing drying of inks.
- Improving coating lay.
- Drying aqueous coatings between printing units prior to spot coating.
- Improving paper stability.

APPLICATION

Paper, Card, Carton Board, Corrugated

CONFIGURATION

- Air knives, exhaust and mounting brackets, with HV cabinet and pre-heater.
- HV cabinet contains switch gear and control components.
- Controls are interlocked with printing impression and emergency stop which turns dyers on and off.
- Dryer and electrical control cabinet are prewired to terminal boards to allow for faster installation.

Enclosures: Sales Terms
Features Table

10954 Shady Trail Dallas, Texas 75220 U.S.A. Telephone 214-353-9000 Telex 794028 Superblue dal Fax 214-357-5847

Super Blue HVL High Velocity Hot Air Drying System

FEATURES	ADVANTAGES	BENEFITS
✪ High velocity hot air knives	✪ Scrubs volatiles such as water and alcohol from paper surface and ink film prior to coating	✪ Increases gloss levels of coatings by minimizing dry back
	✪ Reduces drying time of ink under coating	✪ Minimizes downtime by allowing faster commencement of work and turn and post press operations
	✪ Minimizes if not eliminates spray powder when coating	✪ Increased productivity due to less press maintenance
	✪ Provides ability to print and coat full loads at optimum press speeds	✪ Dramatically increases productivity and profitability
	✪ Increases temperature of stock which reduces viscosity of coating on contact	✪ Optimizes gloss levels ✪ Allows for coating application with near perfect lay characteristics
	✪ Dries water based coating at various positions on the press	✪ Increases variety of saleable product
	✪ Ink applied by previous unit is set	✪ Improved dot definition ✪ Better ink trapping ✪ Helps prevent gas ghosting
✪ Air knife exhaust system	✪ Removes volatiles from press and production area	✪ Decreases drying or setting time ✪ Protects press functions and operators
✪ Time delay on air knife and exhaust knife shut-off	✪ Interstation areas are completely heat evacuated when press is stopped	✪ Comfortable operator makeready and wash-up environment ✪ Comprehensive press protection
✪ Complete training of staff by PRI professionals (Including complete Operator's and Pre-Installation Manuals)	✪ Knowledgeable operators at completion of installation and training	✪ Increased productivity due to responsive training program by PRI ✪ Ability to produce saleable sheets immediately after training

Printing Research, Inc.
"Mark-less" Super Blue®

Williamson Printing
June 28, 1993

SUMMARY OF PROPOSAL

for

PACKAGE 4
OMCSA 2 / 40

	QTY	EQUIPMENT	UNIT PRICE	EXTENSION
A	2	SUPER BLUE PLATE BLANKET COATER (PBC)	$ 76,530.	$153,060.
B	1	SUPER BLUE BACVAC VACUUM DELIVERY SYSTEM (BV)	12,586.	12,586.
C	1	SUPER BLUE HIGH VELOCITY HOT AIR DRYING SYSTEM (HV)	39,992.	39,992.
D	1	SUPER BLUE THREE LAMP 'COLD' UV DRYING SYSTEM (CUV)	87,806.	87,806.
E	1	SUPER BLUE VENT-A-HOOD EXHAUST SYSTEM (VH)	4,000.	4,000.
		TOTAL EQUIPMENT (FOB Factory)		**$297,444.**

FREIGHT PREPAID AND ADDED TO INVOICE, INSTALLATION AND TRAINING CHARGED AT $575. PER DAY PER MAN PLUS AIRFARES

	QTY	RECOMMENDED SPARE PARTS	UNIT PRICE	EXTENSION
A	1	SPARE APPLICATOR ROLL (per inch)	70.	$ 2,800.
	1	SPARE METERING ROLL (per inch)	45.	1,800.
B/C/E		NONE REQUIRED		-------
D	3	SPARE U.V. LAMPS	338.	1,014.
	2	FILTER TUBES	587.	1,174.
	3	DEIONIZING RESIN CARTRIDGES	50.	150.
		TOTAL RECOMMENDED SPARE PARTS		**$ 6,938.**

PROPOSAL, TERMS AND CONDITIONS OF SALE ON REVERSE SIDE ACCEPTED BY:

NAME _____

TITLE _____

SIGNATURE _____

DATE _____

10954 Shady Trail Dallas, Texas 75220 U.S.A. Telephone 214-353-9000 Telex 794028 Superblue dal Fax 214-357-5847

Printing Research, Inc.
"Mark-less" Super Blue®

PBC 093988
Williamson Printing
June 25, 1993

PROPOSAL
PACKAGE 4

SUPER BLUE PBC PLATE AND BLANKET COATER

PRESS	COLOR/SIZE	PRICE
OMCSA	2 / 40	$ 76,530. (each)

One on printing unit one and one on printing unit two

RECOMMENDED SPARE PARTS:

Spare Rolls:	Applicator (per inch)	$ 70.
	Metering (per inch)	$ 45.
Spare Pump Stand:	If intention is to run both aqueous and UV	$ 4,000.

PURPOSE

Application of aqueous or UV coatings to either the plate or blanket cylinder of a press unit, for spot or area coating with exceptional uniformity, clean edges and precise registration.

APPLICATION

Paper, Card, Carton Board, Corrugated, Plastic, Foil

CONFIGURATION

Speed control is maintained via throttling valves mounted on the control cabinet. Start/stop controls are interlocked with press controls to suit. All rolls are variable speed and are ramped to match the selected percentage of surface speed. Applicator roll normally drives slower than plate or blanket surface speed, while metering roll and pick up or pan roll are always less than the applicator. The applicator roll automatically follows the direction of the plate or blanket.

The metering and applicator rollers are rubber, while the pick up roll is chromed microfinished. The metering roll has left and right hand adjustments for on-off contact with pick-up roll and independent manual screw adjustments to set profile. Each roll has vernier indicators for gap adjustment. A stainless steel coater pan is designed for recirculation of coating via a diaphragm pump with a large diameter hose used to return the coating to a 55 gallon drum. The diaphragm pump is plumbed and is installed on a stainless steel coating drum cover incorporating a hinged plexiglass viewing window and an adjustable, audible, and visual warning system.

10954 Shady Trail Dallas, Texas 75220 U.S.A. Telephone 214-353-9000 Telex 794028 Superblue dal Fax 214-357-5847

Super Blue PBC Plate Blanket Coater

FEATURES	ADVANTAGES	BENEFITS
✪ Fully retractable Spot Plate or Blanket coating	✪ Ability to spot or overall coat ✪ In-line coating flexibility without dedicating the last printing unit to coating	✪ Maximum utilization of printing units
✪ Application of coating from plate cylinder	✪ Elimination of lengthy downtime due to registering coating to image ✪ Negates need to cut blankets while press down ✪ Sharp clean, crisp image definition ✪ Water-based coating can replace and surpass press varnish ✪ Coatings have higher scuff resistance than press varnish and are non-yellowing	✪ Simple precise register control ✪ Increased productivity and profitability ✪ Insurmountable quality ✪ Value added to printed sheets ✪ Increased product durability and cosmetic quality
✪ Application of coating from blanket cylinder	✪ Fast makeready since overall coating directly applied from blanket cylinder ✪ Heavy overall coating film weights easily applied ✪ Functional coatings such as remoistenable gum and blister pack coatings easily applied	✪ Increased productivity and profitability ✪ Optimizing gloss and physical properties ✪ Added value to printed work and increased product range capabilities
✪ Sheer application of coatings	✪ Uniform thickness of coating from the plate cylinder ✪ Minimizes slinging or misting of coatings ✪ Allows the widest range of viscosities to be used ✪ Water based coatings will stay open indefinitely on coater while circulating	✪ The best coating lay characteristics for optimized added value ✪ Prevents costly cleanups ✪ Optimizes gloss and physical properties ✪ Minimizes downtime through wash-ups, operators can concentrate on press operation creating higher productivity
✪ Coating pump stand with run dry protection	✪ Visual and audible warning of low coating level in barrel	✪ Complete operator awareness alert and non-stop production
✪ Complete training of staff by PRI professionals (Including complete Operator's and Pre-Installation Manuals)	✪ Knowledgeable operators at completion of installation and training ✪ Recommendation of all production consumables available for start-up.	✪ Increased productivity due to responsive training program by PRI ✪ Ability to produce saleable sheets immediately after training

Printing Research, Inc.
"Mark-less" Super Blue®

BV 093988
Williamson Printing
June 25, 1993

PROPOSAL
PACKAGE 4

SUPER BLUE BACVAC DELIVERY VACUUM TRANSFER SYSTEM

PRESS	COLOR/SIZE	PRICE
OMCSA	2 / 40	$ 12,586.

PURPOSE

- Optimized press speeds with minimal risk of marking varnish, water based or U.V. coatings.
- Stop unnecessary delivery wheel makeready.
- Eliminate starwheel and stop press adjustments.

APPLICATION

Paper, Card, Carton Board, Plastic, Foil

CONFIGURATION

A vacuum transfer system which eliminates marking completely for sheet fed presses. The press grippers pull the sheet, dry side against the BACVAC rollers, which are contoured to the original cylinder path. The vacuum holds the sheets against the rollers, ensuring that the printed and or coated side of the sheet does not come into contact with any surface whatsoever.

Enclosures: Sales Terms
Features Table

10954 Shady Trail Dallas, Texas 75220 U.S.A. Telephone 214-353-9000 Telex 794028 Superblue dal Fax 214-357-5847

Super Blue BacVac

FEATURES	ADVANTAGES	BENEFITS
✪ Vacuum Transfer System with frictionless free wheeling roller support	✪ Assures markfree printed or coated sheets at delivery transfer	✪ Optimized press speed assures higher productivity and profitability.
	✪ Provides ability to print or coat any thickness or grain direction of stock.	✪ Creates total flexibility in choice of stock
	✪ Any stock adheres to vacuum transfer at full press speeds	✪ Guaranteed quality of heavy ink coverage, varnished or coated work.
		✪ Reduced spoilage and over runs
	✪ Decreases need to purchase special stock	✪ Provides added value to finished sheets
	✪ Non-printed or non-coated side of sheet is held by vacuum to the contour of the BacVac rollers	✪ Maximizes ink, varnish or coating applications without marking
	✪ Printed or coated side of sheet does not make contact with any surface	✪ Full coverage without scratching or marking.
	✪ Fully automatic, maintenance free, no adjustments	✪ Eliminates make ready down time at delivery transfer increasing productivity and profitability
	✪ No special tools, no stop press adjustments, no delivery adjustments necessary	
✪ Energy efficient vacuum motor	✪ Continuous controlled air flow	✪ Low cost energy consumption
✪ Automatic on/off	✪ No adjustments necessary	
✪ Complete training of staff by PRI professionals	✪ Knowledgeable operators at completion of installation and training	✪ Increased productivity due to responsive training program by PRI
(Including complete Operator's and Pre-Installation Manuals)		✪ Ability to produce saleable sheets immediately after training.

Printing Research, Inc.
"Mark-less" Super Blue®

HV 093988
Williamson Printing
June 25, 1993

PROPOSAL
PACKAGE 4

SUPER BLUE HV™ HIGH VELOCITY HOT AIR DRYING SYSTEM

PRESS	COLOR/SIZE	MAX KW OUTPUT	MAXIMUM CFM/ HEAT OUTPUT	PRICE
OMCSA	2 / 40	42 Per Cabinet	650/250°F Per Cabinet	$ 39,992. Per Cabinet

One HV cabinet feeding air knives and exhaust between printing units 1/2, delivery

PURPOSE

- Allow work and turn and post processing in minutes, not hours.
- Flashing off solvent and water in conventional inks between printing units.
- Minimize if not eliminate spray powder, when coating.
- Minimizing gloss back or dry back when coating.
- Enhancing drying of inks.
- Improving coating lay.
- Drying aqueous coatings between printing units prior to spot coating.
- Improving paper stability.

APPLICATION

Paper, Card, Carton Board, Corrugated

CONFIGURATION

- Air knives, exhaust and mounting brackets, with HV cabinet and pre-heater.
- HV cabinet contains switch gear and control components.
- Controls are interlocked with printing impression and emergency stop which turns dyers on and off.
- Dryer and electrical control cabinet are prewired to terminal boards to allow for faster installation.

Enclosures: Sales Terms
Features Table

10954 Shady Trail Dallas, Texas 75220 U.S.A. Telephone 214-353-9000 Telex 794028 Superblue dal Fax 214-357-5847

Super Blue HVL High Velocity Hot Air Drying System

FEATURES	ADVANTAGES	BENEFITS
✪ High velocity hot air knives	✪ Scrubs volatiles such as water and alcohol from paper surface and ink film prior to coating	✪ Increases gloss levels of coatings by minimizing dry back
	✪ Reduces drying time of ink under coating	✪ Minimizes downtime by allowing faster commencement of work and turn and post press operations
	✪ Minimizes if not eliminates spray powder when coating	✪ Increased productivity due to less press maintenance
	✪ Provides ability to print and coat full loads at optimum press speeds	✪ Dramatically increases productivity and profitability
	✪ Increases temperature of stock which reduces viscosity of coating on contact	✪ Optimizes gloss levels ✪ Allows for coating application with near perfect lay characteristics
	✪ Dries water based coating at various positions on the press	✪ Increases variety of saleable product
	✪ Ink applied by previous unit is set	✪ Improved dot definition ✪ Better ink trapping ✪ Helps prevent gas ghosting
✪ Air knife exhaust system	✪ Removes volatiles from press and production area	✪ Decreases drying or setting time ✪ Protects press functions and operators
✪ Time delay on air knife and exhaust knife shut-off	✪ Interstation areas are completely heat evacuated when press is stopped	✪ Comfortable operator makeready and wash-up environment ✪ Comprehensive press protection
✪ Complete training of staff by PRI professionals (Including complete Operator's and Pre-Installation Manuals)	✪ Knowledgeable operators at completion of installation and training	✪ Increased productivity due to responsive training program by PRI ✪ Ability to produce saleable sheets immediately after training

Printing Research, Inc.
"Mark-less" Super Blue®

CUV 093988
Williamson Printing
June 25, 1993

PROPOSAL
PACKAGE 4

SUPER BLUE 'COLD' UV DRYING SYSTEM

PRESS	COLOR/SIZE	LAMPS	RATING	PRICE
OMSCA	2 / 40	3	300 watt/inch	$ 87,806.

RECOMMENDED SPARE PARTS:

UV Lamps (each)	$338.
Filter Tubes (each)	$587.
Deionizing Resin Cartridge (each)	$ 50.

PURPOSE

Curing (drying) UV inks, varnishes or coating on sheet or web fed presses.

APPLICATION

Paper, Card, Carton Board, Corrugated, Plastic, Foil

CONFIGURATION

Curing heads are linked to impression of press and automatically switch to standby mode when press is off impression for five minutes. If no further action is taken, then lamps automatically turn off; if the press is put back into impression, the lamps automatically return to full power.

Standard Control Unit contains all necessary switchgear and controls to provide individual lamp selection, full and reduced individual power switching, elapsed life meters, lamp indicators and emergency stop button.

Main power transformer, capacitor banks and closed loop exchanger plant are supplied as floor standing modules. Full safety interlock circuits are fitted throughout. Ozone and heat extraction from the press are not normally required.

Enclosures: Sales Terms
Features Table

10954 Shady Trail Dallas, Texas 75220 U.S.A. Telephone 214-353-9000 Telex 794028 Superblue dal Fax 214-357-5847

SUPER BLUE 'COLD' UV DRYING SYSTEM

FEATURES	ADVANTAGES	BENEFITS
✪ Quartz Filter Tubes carrying deionized distilled water	✪ Allows 98-99% of the UV to pass through	✪ Maximizes curing efficiency which results in full production press speeds
	✪ Filters most of the unwanted heat	✪ Minimizes risk of fire and resultant downtime
	✪ Ensures low stack temperatures	✪ Eliminates risk of distortion of heat sensitive stock
✪ Closed Loop Deionizing chilled water system	✪ Allows complete temperature control of water recirculation system	✪ No costly losses of heating or cooling energy from the plant
✪ Low Volume Compressed Air Lamp Cooling	✪ Ensures minimal ozone production	✪ Creates a safe work place environment meeting all OSHA and EPA standards
	✪ Ensures lamp running temperatures are precise	✪ Assures optimum efficiency level of UV output
✪ Heat Exhaust System (HES) installed between printing units	✪ Reduces heat build-up created by chemical reaction of inks	✪ Eliminates expensive downtime caused by ink piling on the blankets
	✪ Reduces tack levels of ink	✪ Decreases risk of hickies and the cost of downtime to remove hickies on work and turn
	✪ Prevents heat build-up between printing units	✪ Protects press functions and operators
✪ Water cooled UV lamp head and delivery reflector pan	✪ Absorbs most of the unwanted heat	✪ Prevents risk of press damage
	✪ Prevents heat build-up of delivery stack	✪ Eliminates risk of stock distortion in stack
		✪ Decreases risk of waste sheets caused by offsetting of C2S stock when printed or coated first side
✪ Complete Training of staff by PRI professionals (Including complete Operator's and Pre-Installation Manuals)	✪ Knowledgeable operators at completion of installation and training	✪ Increased productivity due to responsive training program by PRI
		✪ Ability to produce saleable sheets immediately after training

Printing Research, Inc.
"Mark-less" Super Blue®

VH 093988
Williamson Printing
June 25, 1993

PROPOSAL
PACKAGE 4

SUPER BLUE VENT-A HOOD EXHAUST SYSTEM

PRESS	COLOR/SIZE	COATING/DRYING	PRICE
OMCSA	2 / 40	PBC/HV-CUV	$ 4,000.

PURPOSE

To be installed on the delivery of the press to exhaust moisture laden air, lowering the humidity within the delivery area. Reduces the need for spray powder increasing the efficiency of the existing dryer.

FEATURES

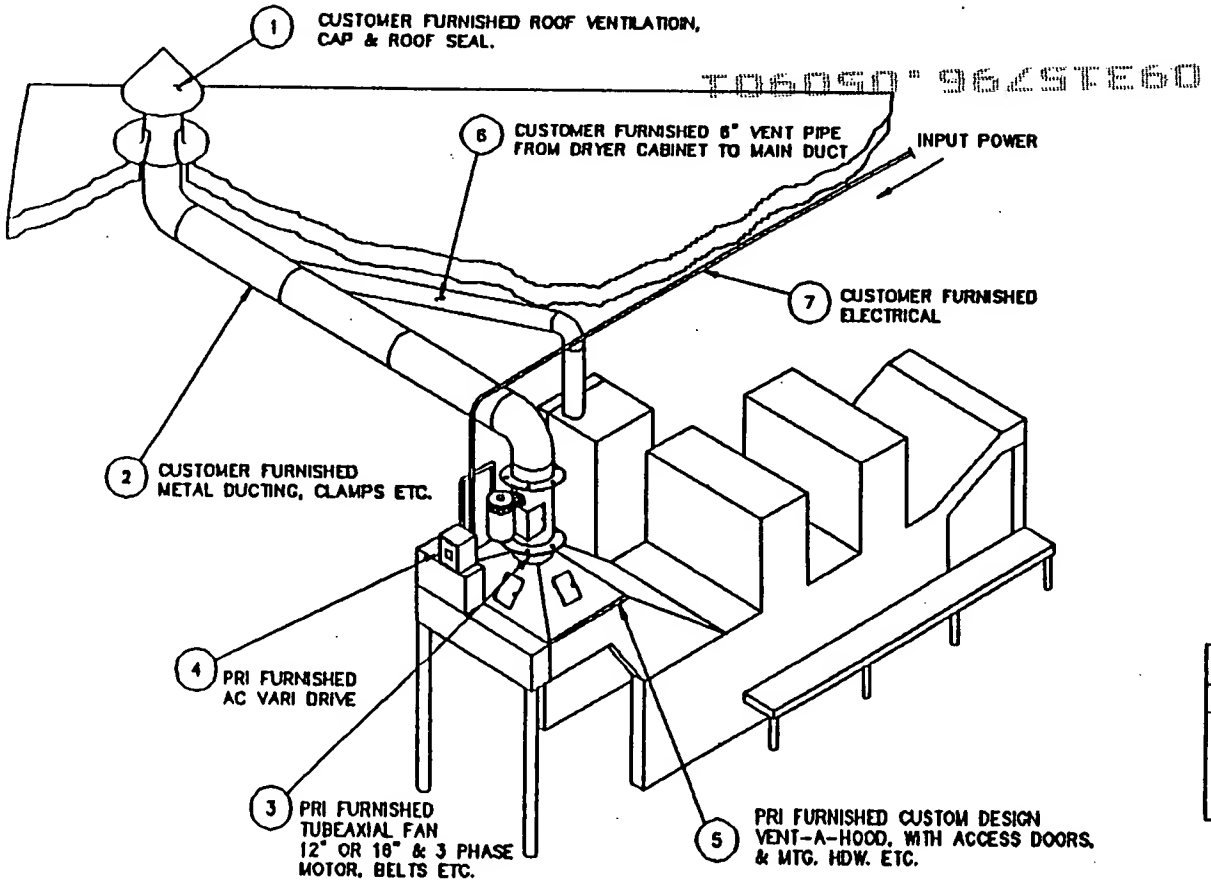
This specially designed exhaust system utilizes a high output fan with variable power speed control at the delivery of your press. The Vent-A-Hood exhaust helps minimize the build up of moisture within the drying area of the press.

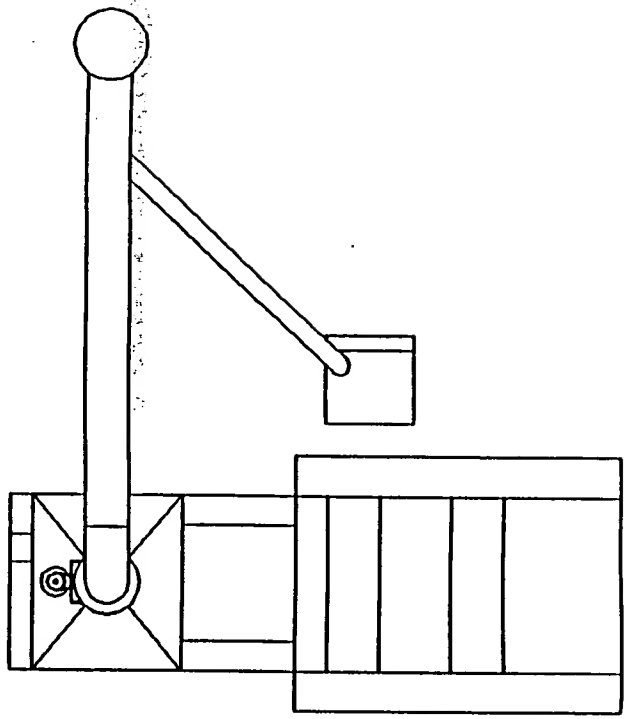
BENEFITS

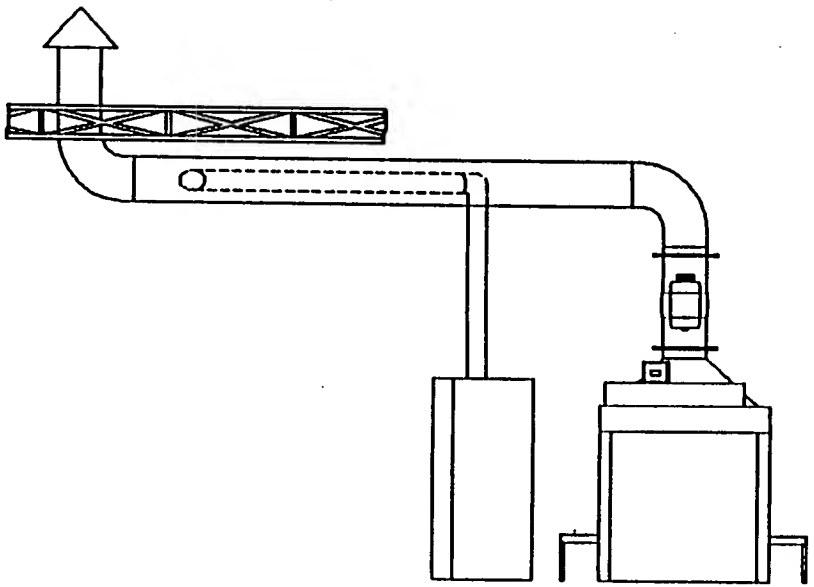
- Enhances the capabilities of your current dryer.
- Help remove excess spray powder.
- Minimizes unpleasant odors at the delivery.
- Reduces the need for spray powder.

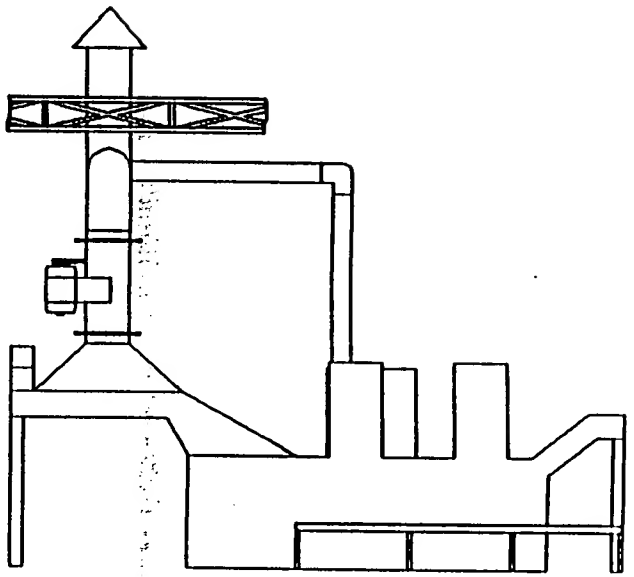
Enclosures: Sales Terms
Features Table

10954 Shady Trail Dallas, Texas 75220 U.S.A. Telephone 214-353-9000 Telex 794028 Superblue dal Fax 214-357-5847


1 CUSTOMER FURNISHED ROOF VENTILATION, CAP & ROOF SEAL.
T060S0" 96CSTE60
6 CUSTOMER FURNISHED 6" VENT PIPE FROM DRYER CABINET TO MAIN DUCT
INPUT POWER
7 CUSTOMER FURNISHED ELECTRICAL
2 CUSTOMER FURNISHED METAL DUCTING, CLAMPS ETC.
4 PRI FURNISHED AC VARI DRIVE
3 PRI FURNISHED TUBEAXIAL FAN 12" OR 16" & 3 PHASE MOTOR, BELTS ETC.
5 PRI FURNISHED CUSTOM DESIGN VENT-A-HOOD, WITH ACCESS DOORS, & MTG. HDW. ETC.







Printing Research, Inc.
"Mark-less" Super Blue®

Williamson Printing
June 25, 1993

SUMMARY OF PROPOSAL
PACKAGE 5

KOMORI LITHRONE 6 / 40

QTY	EQUIPMENT	UNIT PRICE	EXTENSION
2	SUPER BLUE HIGH VELOCITY HOT AIR DRYER SYSTEM (HV)	$ 39,992.	$ 79,984.
	TOTAL EQUIPMENT (FOB Factory)		**$ 79,984.**

FREIGHT PREPAID AND ADDED TO INVOICE, INSTALLATION AND TRAINING CHARGED AT $575. PER DAY PER MAN PLUS AIRFARES

QTY	RECOMMENDED SPARE PARTS	UNIT PRICE	EXTENSION
	NONE REQUIRED		

PROPOSAL, TERMS AND CONDITIONS OF SALE ON REVERSE SIDE ACCEPTED BY:

NAME _____

TITLE _____

SIGNATURE _____

DATE _____

10954 Shady Trail Dallas, Texas 75220 U.S.A. Telephone 214-353-9000 Telex 794028 Superblue dal Fax 214-357-5847

Printing Research, Inc.
"Mark-less" Super Blue®

HV 093988
Williamson Printing
June 25, 1993

PROPOSAL
PACKAGE 5

SUPER BLUE HV™ HIGH VELOCITY HOT AIR DRYING SYSTEM

PRESS	COLOR/SIZE	MAX KW OUTPUT	MAXIMUM CFM/ HEAT OUTPUT	PRICE
KOMORI LITHRONE	6 / 40	42 Per Cabinet	650/250°F Per Cabinet	$ 39,992. Per Cabinet

One HV cabinet feeding air knives and exhaust between printing units 1/2, 2/3, 3/4
One HV cabinet feeding air knives and exhaust between printing units 4/5, 5/6

PURPOSE

- Allow work and turn and post processing in minutes, not hours.
- Flashing off solvent and water in conventional inks between printing units.
- Minimize if not eliminate spray powder, when coating.
- Minimizing gloss back or dry back when coating.
- Enhancing drying of inks.
- Improving coating lay.
- Drying aqueous coatings between printing units prior to spot coating.
- Improving paper stability.

APPLICATION

Paper, Card, Carton Board, Corrugated

CONFIGURATION

- Air knives, exhaust and mounting brackets, with HV cabinet and pre-heater.
- HV cabinet contains switch gear and control components.
- Controls are interlocked with printing impression and emergency stop which turns dyers on and off.
- Dryer and electrical control cabinet are prewired to terminal boards to allow for faster installation.

Enclosures: Sales Terms
Features Table

10954 Shady Trail Dallas, Texas 75220 U.S.A. Telephone 214-353-9000 Telex 794028 Superblue dal Fax 214-357-5847

Super Blue HVL High Velocity Hot Air Drying System

FEATURES	ADVANTAGES	BENEFITS
✪ High velocity hot air knives	✪ Scrubs volatiles such as water and alcohol from paper surface and ink film prior to coating	✪ Increases gloss levels of coatings by minimizing dry back
	✪ Reduces drying time of ink under coating	✪ Minimizes downtime by allowing faster commencement of work and turn and post press operations
	✪ Minimizes if not eliminates spray powder when coating	✪ Increased productivity due to less press maintenance
	✪ Provides ability to print and coat full loads at optimum press speeds	✪ Dramatically increases productivity and profitability
	✪ Increases temperature of stock which reduces viscosity of coating on contact	✪ Optimizes gloss levels ✪ Allows for coating application with near perfect lay characteristics
	✪ Dries water based coating at various positions on the press	✪ Increases variety of saleable product
	✪ Ink applied by previous unit is set	✪ Improved dot definition ✪ Better ink trapping ✪ Helps prevent gas ghosting
✪ Air knife exhaust system	✪ Removes volatiles from press and production area	✪ Decreases drying or setting time ✪ Protects press functions and operators
✪ Time delay on air knife and exhaust knife shut-off	✪ Interstation areas are completely heat evacuated when press is stopped	✪ Comfortable operator makeready and wash-up environment ✪ Comprehensive press protection
✪ Complete training of staff by PRI professionals (Including complete Operator's and Pre-Installation Manuals)	✪ Knowledgeable operators at completion of installation and training	✪ Increased productivity due to responsive training program by PRI ✪ Ability to produce saleable sheets immediately after training

PRINTING RESEARCH, INC.
TERMS OF PROPOSAL

1. PRICING: Prices are based on clear access to and within the press to install our standard equipment. Any variance, deviation or encumbrance will be subject to price review. Installation is priced separately and all electrical, plumbing, engineering or other contracted services including materials to prepare the site for installation are the customers responsibility.

2. TERMS: 40% with purchase order and signed sales contract. 50% upon notification of readiness for shipment. Please note in order to release shipments, payment must be received. Balance 30 days after installation or 45 days from delivery, whichever is earlier. Please Note, when payment for a unit is due, it is payable without regard to the status of another unit which might be purchased at the same time.

3. WARRANTY CONDITIONS: 12 months on defective parts. EXCEPTION: UV Lamps - All guaranteed for 1000 operating hours. If failure occurs prior to 1000 hours of operation, 100% credit or a free replacement lamp will be provided.

4. CONDITIONS OF SALE: This quotation is subject to our "General Terms and Conditions Coating and Drying Systems" on reverse of Summary. The company accepts no liability whatsoever for any loss of production, loss of profit or other loss to customer in connection with the equipment and/or its installation.
5. STANDARD DELIVERY: Is usually 12 - 16 weeks from receipt of official order and first stage payment. FOB Factory.
6. INSTALLATION AND TRAINING: $575.00 per day per man plus airfare.
7. ELECTRICAL STANDARD: 220/460/480 volts, 3 or 4 wire (Delta or Wye) 60 hz.
   Note: Electrical services must be specified on the purchase order.

8. SERVICES TO BE PAID FOR AND PROVIDED BY CUSTOMER:

   GENERAL: Buyer agrees to prepare the press for installation, which may require relocating accessories including spray powder units, static bars, etc. Any relocation or modification of accessorieswill be the sole responsibility of the buyer. In the event Printing Research (P.R.I.) technicians are requested to modify or relocate any accessory, there will be an additional charge assessed to the buyer based on P.R.I.'s applicable hourly rate. P.R.I. will not warranty the performance of any accessories moved. When applicable, the buyer will supply clean, dry compressed air.

   HV/PBC/IR/UV/EZ/BV/VH

   The customer agrees to supply and pay for electricians, plumbers, engineering services and all materials required to install and interconnect (if necessary) the equipment being supplied by Printing Research, Inc. The electrical, plumbing, water, compressed air and refrigeration lines being supplied by the customer are to be connected to the equipment being installed. Printing Research, Inc. is responsible for activating the installed systems and will supply the labor necessary in that regard.

9. ADDITIONAL SPECIFIC SERVICES TO BE PROVIDED BY CUSTOMER:

   HV (High Velocity Hot Air Dryer)
   - ☐ Provide duct work and duct work extraction.
   - ☐ Provide raised walkplates to cover air supply and return lines lying on the floor.

   PBC (Plate Blanket Coater)
   - ☐ Provide coating and cleaning agent for testing and training.
   - ☐ 55 gallon barrel of hydraulic oil
   - ☐ Compressed air line up to 100 p.s.i.
   - ☐ Lifting gear to place coater on press
   - ☐ Provide relief plate to conduct plate coating test.

   UV (Water Cooled and 'Cold' UV)
   - ☐ Duct work and extraction, if required
   - ☐ Clean, dry compressed air adjacent to within 10 feet of the location of lamps; compressor must be able to deliver 0.5 c.f.m. per linear inch per lamp at up to 100 p.s.i.
   - ☐ The chilling system is not precharged with refrigerant due to the variability of installation requirements and is priced accordingly. The customer agrees to pay for all refrigerant needed to complete the installation.

   'COLD' UV
   - ☐ Provide 25-50 gallons of non-charcoal filtered steam distilled water.

   EZ (EZ Impression Cylinder Coater)
   - ☐ Compressed air line up to 100 p.s.i.
   - ☐ Provide coating and cleaning agent for testing and training.

   VH (Vent-A-Hood)
   - ☐ Provide all duct work including penetrating and resealing the ceiling and/or roof and electrical interconnections to other equipment.

10. LOCAL INSPECTIONS, PERMITS OR CERTIFICATIONS:
    - ☐ Any additional local inspections, permits or certifications and the costs thereof are the sole responsibility of the buyer.

Prices are firm 60 days from the date of this proposal.

Printing Research, Inc.
"Mark-less" Super Blue®

August 31, 1994

Mr. Jesse Williamson
Williamson Printing Corporation
6700 Denton Drive
Dallas, TX 75235

214-904-2100 (Phone)

Dear Jesse,

Further to our various conversations, we have enclosed product information and the following **Super Blue** proposal for installation on your:

1. **Heidelberg Speedmaster CD 102**, 7 color with coating tower, 40 inch press (Press being delivered 9-6-94).

We propose:

- A **Super Blue** HV High Velocity Hot Air Drying System for installation between printing units.
- A **Super Blue** ABII Air Blanket II 2KW Infra-Red Drying System for installation in the delivery. (PRI to deliver within 3 weeks of 9-6-94)

2. **Heidelberg Speedmaster CD 102**, 6 color with coating tower, 40 inch press (Press being delivered the week of 9-27-94).

We propose:

- A **Super Blue** HV High Velocity Hot Air Drying System for installation between printing units.
- A **Super Blue** ABII Air Blanket II 2KW Infra-Red Drying System for installation in the delivery.

3. **Heidelberg Speedmaster CD +L+Y+L 102**, 6 color with coating tower (L), with dummy unit for drying (Y), with second coating tower (L). 40 inch press (Press being delivered January '95).

We propose:

- A **Super Blue** HV High Velocity Hot Air Drying System for installation between printing units.
- A **Super Blue** ABII Air Blanket II 2KW Infra-Red Drying System for installation in the delivery.
- A **Super Blue** CUV 'Cold' UV Drying System for installation in the delivery.

10954 Shady Trail Dallas, Texas 75220 U.S.A. Telephone 214-353-9000 Telex 794028 Superblue dal Fax 214-357-5847

4A. **Heidelberg Speedmaster CD 102**, 8 color with coating tower, 40 inch press

B. **Heidelberg Speedmaster CD 102**, 8 color with coating tower, 40 inch press (Both presses being delivered June/July 1995).

We propose:

- A **Super Blue** HV High Velocity Hot Air Drying System for installation between printing units.
- A **Super Blue** ABII Air Blanket II 2KW Infra-Red Drying System for installation in the delivery.

We look forward to serving your needs and thank you for your interest in our **Super Blue** range of products. For more information please contact us at 1-800-627-5537.

Sincerely yours,

John Bird
Product Manager

JB:fj

Enclosures: PI/FAB

cc: Bill Davis - Williamson Printing Corp.
Bob Emrick - Williamson Printing Corp.

Printing Research, Inc.
"Mark-less" Super Blue®

September 6, 1994

Mr. Jesse Williamson
Williamson Printing Corporation
6700 Denton Drive
Dallas, TX 75235

214-904-2100 (Phone)

Dear Jesse,

It was a great pleasure for Howard and me to meet with you, Woody, Bill and Bob. The following confirms the major points discussed and agreed:

Press Purchase 1. Heidelberg Speedmaster CD102, 7 color with coating tower, 40 inch press. PRI equipment to be supplied:

- A **Super Blue** HV High Velocity Hot Air Drying System for installation between printing units.
- A **Super Blue** ABII Air Blanket II 2KW Infra-Red Drying System for installation in the delivery.

Special Conditions:

A. Purchase, delivery, installation and training charges are waived for drying system 1.
B. PRI to install HV when Williamson Printing Corporation (WPC) signs off on press.
C. In the unlikely event that PRI fails to dry water based coatings applied in line over 7 colors, we will remove our equipment and purchase a Grafix drying system as previously proposed by Heidelberg.

Press Purchase 2: Heidelberg Speedmaster CD 102, 6 color with coating tower, 40 inch press. PRI equipment to be purchased:

- A **Super Blue** HV High Velocity Hot Air Drying System for installation between printing units.
- A **Super Blue** ABII Air Blanket II 2KW Infra-Red Drying System for installation in the delivery.

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Press Purchase 3: Heidelberg Speedmaster CD 102 L+Y+L, 6 color with coating tower (L) with dummy unit for drying (Y) and with second coating tower (L) 40 inch press. PRI equipment to be purchased:

- A **Super Blue** HV High Velocity Hot Air Drying System for installation between printing units.
- A **Super Blue** ABII Air Blanket II 2KW Infra-Red Drying System for installation in the delivery.
- A **Super Blue** CUV 'Cold' UV Drying System for installation in the delivery.

Press Purchase 4: Heidelberg Speedmaster CD 102, 8 color with coating tower 40 inch press:

- A **Super Blue** HV High Velocity Hot Air Drying System for installation between printing units.
- A **Super Blue** ABII Air Blanket II 2KW Infra-Red Drying System for installation in the delivery.

Press Purchase 5: Heidelberg Speedmaster CD 102, 8 color with coating tower 40 inch press:

- A **Super Blue** HV High Velocity Hot Air Drying System for installation between printing units.
- A **Super Blue** ABII Air Blanket II 2KW Infra-Red Drying System for installation in the delivery.

Special Conditions:

A. We have discounted the total PRI drying equipment price of $528,956 by supplying WPC the drying equipment for Press Purchase 1 at no charge and by allowing a further discount of 20% against the drying equipment for Press Purchases 2, 3, 4, 5.
B. We are supplying three recommended spare parts systems at no charge, all three of which to be supplied with PRI equipment for press purchases 1, 2, and 3.
C. We are extending our standard warranty conditions, Paragraph 3 'Terms of Proposal', Paragraph 6 'Sales Terms and Conditions' from 12 months to 24 months.

The following represents our estimated installation costs:

Press Purchase 1: No charge.
Please note: There will be three exhaust terminations at the press to be completed by the customer. Two PRI and one Heidelberg pan exhaust.

Press Purchase 2:

Delivery, installation and training costs priced at:	
18 man days at $400 per day or	$ 7,200
Equipment interconnection costs	
including materials and 4 man days at	$ 3,600
Total cost:	$10,800

Please note: There will be three exhaust terminations at the press to be completed by the customer, two PRI and one Heidelberg pan exhaust.

Press Purchase 3:

Delivery, installation and training costs priced at:	
34 man days at $400 per day or	$13,600
Equipment interconnection costs	
including plumbing materials and 8 man days at	$11,400
Total cost:	$25,000

Please note: There will be five exhaust terminations at the press to be completed by the customer, four PRI and one Heidelberg pan exhaust.

Press Purchase 4:

Delivery installation and training costs priced at:	
20 man days at $400 per day or	$ 8,000
Equipment interconnection costs	
including materials and 5 man days at	$ 4,300
Total cost:	$12,300

Please note: There will be three exhaust terminations at the press to be completed by the customer, two PRI and one Heidelberg pan exhaust.

Press Purchase 5:

Delivery installation and training costs priced at:	
20 man days at $400 per day or	$ 8,000
Equipment interconnection costs	
including materials and 5 man days at	$ 4,300
Total cost :	$12,300

Please note: There will be three exhaust terminations at the press to be completed by the customer, two PRI and one Heidelberg pan exhaust.

Total turnkey price to install all PRI equipment on five presses, therefore: **$60,400.**

Special notes: All above pricing is estimated on the basis of I. Control cabinets and interconnecting is no more than 10 feet from the side of the press. II. Overhead runs of cables etc.. to be no more than 15 feet from the floor line.

We look forward to serving your needs and thank you for your interest in our **Super Blue** range of products. For more information please contact us at 1-800-627-5537.

Sincerely yours,

John Bird
Product Manager

JB:tj

cc: Woody Dixon - Williamson Printing Corporation
Bill Davis - Williamson Printing Corporation
Bob Emrick - Williamson Printing Corporation

Printing Research, Inc.
"Mark-less" Super Blue®

September 6, 1994

Mr. Jesse Williamson
Williamson Printing Corporation
6700 Denton Drive
Dallas TX 75229

Dear Jesse:

Pursuant to Paragraph 2 of the Settlement Agreement dated October 1, 1993, among Printing Research, Inc. (PRI), Howard W. DeMoore (HWD), Williamson Printing Corporation (WPC), Jerry B. Williamson, III, Jesse Speight Williamson and Buford Roy Williams, WPC agreed to purchase goods and services from PRI on the terms set forth therein. PRI has recently submitted to WPC a proposal pursuant to which PRI would sell certain goods and services to Heidelberg USA for inclusion in printing presses to be purchased by WPC.

This letter will acknowledge and confirm that the sale by PRI to Heidelberg USA of the ABII Air Blanket II 2KW Infrared Dryer as described in Proposal I dated August 31, 1994, for inclusion in the Heidelberg CD102, 7-color with coating tower, 40-inch press to be purchased by WPC, will constitute full and complete satisfaction by WPC of Paragraph 2 of the Settlement Agreement. The terms and provisions of Paragraph 2 of the Settlement Agreement will be deemed fully and completely satisfied by WPC upon PRI's receipt of a binding purchase order from Heidelberg USA for the ABII Air Blanket II 2KW Infrared Dryer regardless of whether such drying system is ultimately accepted by WPC after installation and testing pursuant to the terms of WPC's contract with Heidelberg USA.

PRI further agrees that, in the event the ABII 2KW Infrared Dryer is not ultimately accepted by WPC after installation and testing pursuant to the terms of WPC's contract with Heidelberg USA, PRI will replace such drying system with the Grafix Dryer originally specified for the press at no charge to WPC.

Best regards,

Howard W DeMoore

Howard W. DeMoore,
As President and Individually

HWD:ln

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Printing Research, Inc.
"Mark-less" Super Blue®

TELEFAX MESSAGE FROM PRINTING RESEARCH, INC.

REF FAX NR : **915jb1**

DATE : **September 15, 1994** **PAGE 1 OF 4**

COMPANY : **WILLIAMSON PRINTING CORP.**

ATTN : **BILL DAVIS** - 17,900

Dear Bill,

Please find the attached letter from Printing Research. Please feel free to contact us if you have any questions. Thank you.

Best Regards,

John Bird
Product Manager

10954 Shady Trail Dallas, Texas 75220 U.S.A. Telephone 214-353-9000 Telex 794028 Superblue dal Fax 214-357-5847

Printing Research, Inc.
"Mark-less" Super Blue®

September 15, 1994

Mr. Jesse Williamson
Williamson Printing Corporation
6700 Denton Drive
Dallas, TX 75235
214-904-2100 (Phone)

Dear Jesse,

The following confirms our various conversations and the final purchase agreement schedule:

Press Purchase 1. Heidelberg Speedmaster CD102, 7 color with coating tower, 40 inch press. PRI equipment to be supplied:

- A **Super Blue** HV High Velocity Hot Air Drying System for installation between printing units.
- A **Super Blue** ABII Air Blanket II 2KW Infra-Red Drying System for installation in the delivery.

Special Conditions:

A. Purchase, delivery, installation and training charges are waived for drying system 1.
B. PRI to install HV when Williamson Printing Corporation (WPC) signs off on press.
C. In the unlikely event that the PRI drying system fails to dry water based coatings applied in line over 7 colors to Williamson Printing Corporation's sole satisfaction or if the system is detrimental in any way to the press or process as determined by Williamson Printing Corporation, we will remove our equipment and purchase a Grafix drying system as previously proposed by Heidelberg at no cost to Williamson.

Equipment Cost:	$81,173
Discount:	$81,173
	NO CHARGE
Spare Parts, Delivery, Installation, Interconnect, Training	NO CHARGE

Press Purchase 2: Heidelberg Speedmaster CD 102, 6 color with coating tower, 40 inch press. PRI equipment to be purchased:

- A **Super Blue** HV High Velocity Hot Air Drying System for installation between printing units.
- A **Super Blue** ABII Air Blanket II 2KW Infra-Red Drying System for installation in the delivery.

Equipment Cost:	$73,281
Less 20%:	$14,656
	$58,625
Plus - Spare Parts (Box of 10 Lamps)	NO CHARGE
Plus - Delivery, Installation & Training	$ 7,200
	$65,825

Press Purchase 3: Heidelberg Speedmaster CD 102 L+Y+L, 6 color with coating tower (L) with dummy unit for drying (Y) and with second coating tower (L) 40 inch press. PRI equipment to be purchased:

- A **Super Blue** HV High Velocity Hot Air Drying System for installation between printing units.
- A **Super Blue** ABII Air Blanket II 2KW Infra-Red Drying System for installation in the delivery.
- A **Super Blue** CUV 'Cold' UV Drying System for installation in the delivery. Note: Utilizes WPC Chill Water System.

Equipment Cost:	$181,216
Less 20%:	$ 36,243
	$144,973
Plus - Spare Parts (Box of 10 IR Lamps), 3 UV Lamps, 2 Filter Tubes, Deionizing Resin	NO CHARGE
Plus - Delivery, Installation & Training	$ 13,600
	$158,573

Press Purchase 4: Heidelberg Speedmaster CD 102, 8 color with coating tower 40 inch press:

- A **Super Blue** HV High Velocity Hot Air Drying System for installation between printing units.
- A **Super Blue** ABII Air Blanket II 2KW Infra-Red Drying System for installation in the delivery.

Equipment Cost:	$ 89,023
Less 20%:	$ 17,805
	$ 71,218
Plus - Delivery, Installation & Training	$ 8,000
	$ 79,218

Press Purchase 5: Heidelberg Speedmaster CD 102, 8 color with coating tower 40 inch press:

- A **Super Blue** HV High Velocity Hot Air Drying System for installation between printing units.

- A **Super Blue** ABII Air Blanket II 2KW Infra-Red Drying System for installation in the delivery.

Equipment Cost:	$ 89,023
Less 20%:	$ 17,805
	$ 71,218
Plus - Delivery, Installation & Training	$ 8,000
	$ 79,218

Special Conditions:

A. We have discounted the total PRI drying equipment price of $528,956 by supplying WPC the drying equipment for Press Purchase 1 at no charge and by allowing a further discount of 20% against the drying equipment for Press Purchases 2, 3, 4, 5.
B. We are supplying three recommended spare parts systems at no charge, all three of which to be supplied with PRI equipment for press purchases 1, 2, and 3.
C. We are extending our standard warranty conditions, Paragraph 3 'Terms of Proposal', Paragraph 6 'Sales Terms and Conditions' from 12 months to 24 months.

If this document represents your understanding of our agreement, please initial and return a copy. We thank you for your order and confidence in PRI and look forward to Partnering in Progress.

Sincerely yours,

John Bird
Product Manager

JB:tj

cc: Bill Davis - Williamson Printing Corporation
Woody Dixon - Williamson Printing Corporation

Printing Research, Inc.
"Mark-less" Super Blue®

December 16, 1994

Mr. Bill Davis
Williamson Printing Corporation
6700 Denton Drive
Dallas TX 75229

Dear Bill,

We have enclosed drawings showing the 5 Heidelberg Speedmaster CD press configurations ordered by yourselves.

We look forward to our test runs on the Super Blue EZ Blanket Coater next week.

Sincerely yours,

John Bird
Product Manager

JB:ln

Enclosures: DWG

cc: Steve Baker

10954 Shady Trail Dallas, Texas 75220 U.S.A. Telephone 214-353-9000 Telex 794028 Superblue dal Fax 214-357-5847

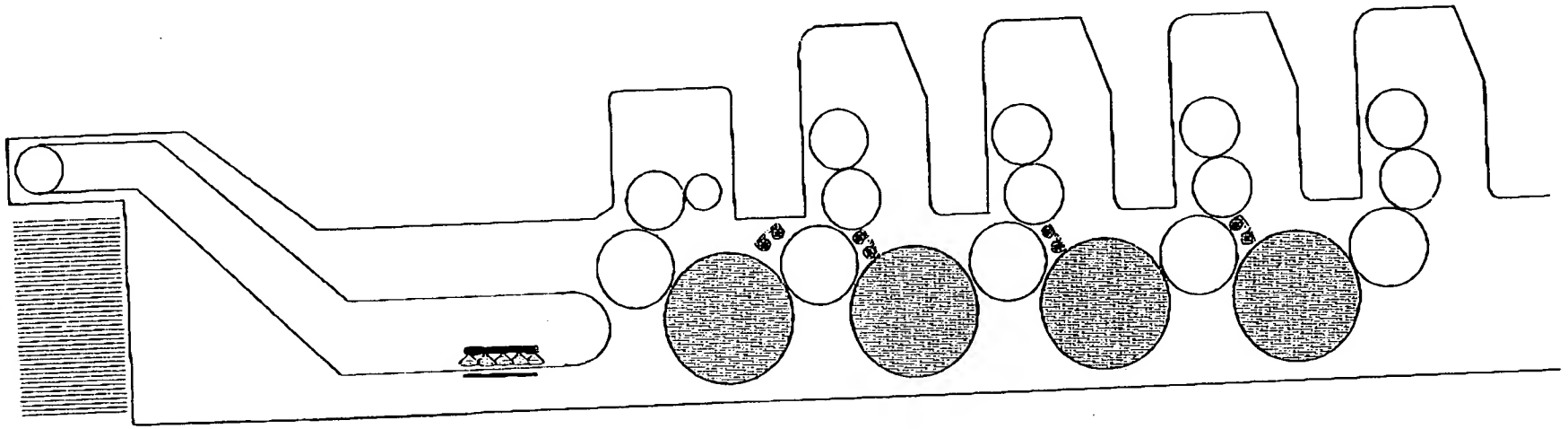
T06050" 96ZSTE6D

Williamson Printing Corporation

Press No. 1, 2, 4 & 5

Heidelberg Speedmaster CD

with Coating Tower and Extended Delivery

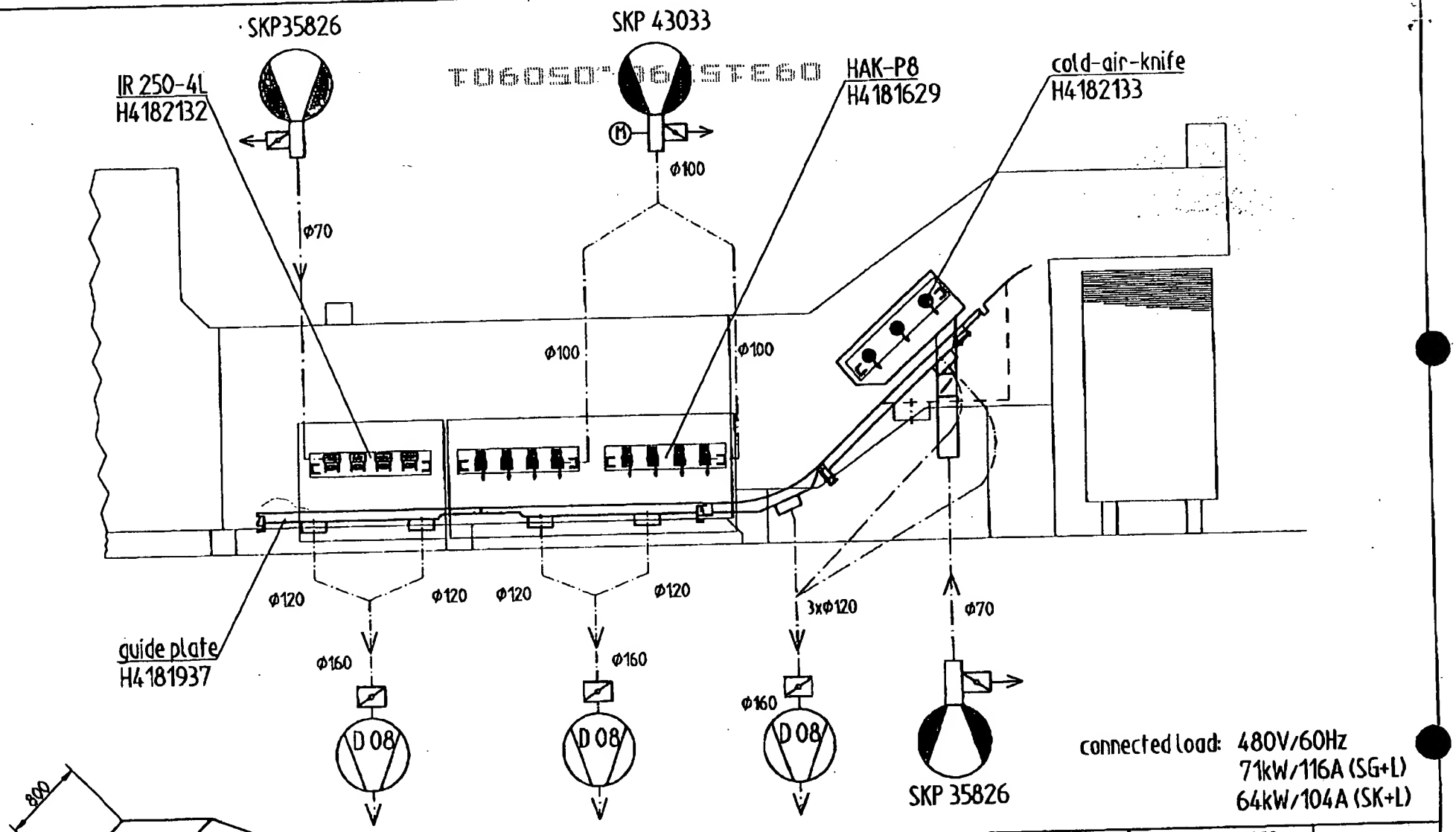


Legend:

- **Super Blue®** Wash-Free Anti-Marking Cylinder
- **Super Blue®** Air Blanket Infrared Dryer
- **Super Blue®** High Velocity Hot Air Dryer

Printing Research, Inc.

270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3xØ120
Ø70
guide plate
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D 08
D 08
D 08
SKP 35826
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IR/HAK
1010 12 K
connected load: 480V/60Hz
71kW/116A (SG+L)
64kW/104A (SK+L)
GRAFIX
Maßstab 1:20
1994
Datum 25.01.
Bearb.
Gepr.
Norm
HDM SG+L+ext.(SK+L+ext.)
with GRAFIX exhaust guide plates
H4182520
Blatt
Zust
Aenderung
Datum
Name

Printing Research, Inc.
"Mark-less" Super Blue"

January 25, 1995

Mr. Jesse Williamson
Williamson Printing Corporation
6700 Denton Drive
Dallas TX 75235

214-904-2100 (Phone)

Dear Jesse,

It was a great pleasure speaking with you. We have enclosed product information and the following **Super Blue** proposal for installation on your:

Heidelberg 102CD+L+Y+L, 6 color, 40 inch press with extension

We propose:

- A **Super Blue** EZB Blanket Coater for installation at the blanket cylinder.

The benefits to you of installing the **Super Blue** Coater System are as follows:

- Automatic recirculation system
- Automated wash up procedure
- Consistent overall coating weight
- Sealed doctor blade assembly
- Totally independent of dampening system
- Elimination of lengthy wash up procedures

We look forward to serving your needs and thank you for your interest in our **Super Blue** range of products. For more information please contact us at 1-800-627-5537.

Sincerely yours,

Steve Baker
District Sales Manager

SB:nw

Enclosures: PI/PRO/DWG

cc: Bill Davis - Williamson Printing Corporation
John Bird
Steve Garner

10954 Shady Trail Dallas, Texas 75220 U.S.A. Telephone 214-353-9000 Telex 794028 Superblue dal Fax 214-357-5847

Printing Research, Inc.
"Mark-less" Super Blue®

February 16, 1995

Mr. Jesse Williamson
Williamson Printing Company
6700 Denton Drive
Dallas, Texas 75235

214-904-2100 (Phone)

Dear Jesse,

Further to our meeting of 2-11-95 we confirm the following:

1. We are producing an experimental EZ interstation flexo printer coater for installation on your Heidelberg Speedmaster CD 6 color + LYL, 40 inch press with a target to be installed and operational date of March 15, 1995. This unit for adaptation to the first coating tower of the LYL.

2. The experimental EZ coater will have a coating face length of 39.5 inches. Production models for the Coater position 'L' will have a coating face length of 40.55 inches and for interstation printing unit positions will have a coating face length of not less than 38 inches.

3. The experimental EZ coater will be supplied at no charge to Williamson Printing Company. We anticipate that this unit will be replaced by a production unit at a later date.

4. We have enclosed updated proposals for Super Blue EZ interstation flexo printer coaters for installation on your Heidelberg Speedmaster CD presses.

We look forward to serving your needs and thank you for your interest in our **Super Blue** range of products. For more information please contact us at 1-800-627-5537.

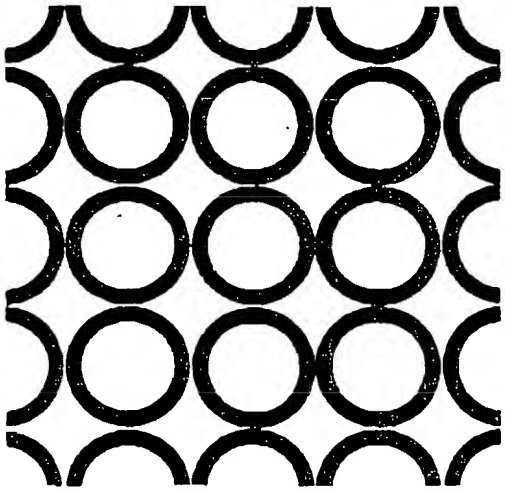
Sincerely yours,

John Bird
Product Manager

JB:tj

cc: Bill Davis - Williamson Printing Company
Howard DeMoore
Steve Garner
Ed Schaffler
Dave Douglas
Steve Baker

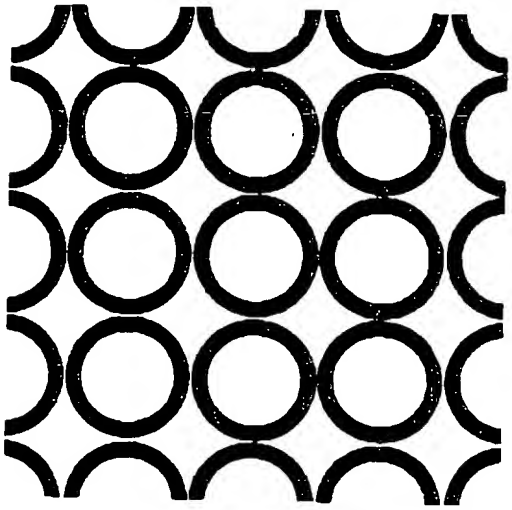
10954 Shady Trail Dallas, Texas 75220 U.S.A. Telephone 214-353-9000 Telex 794028 Superblue dal Fax 214-357-5847



SUPER BLUE

THE EZ PRINT/ COAT FAMILY

MAXIMUM FLEXOBILITY AND A TOUCH OF BRILLIANCE

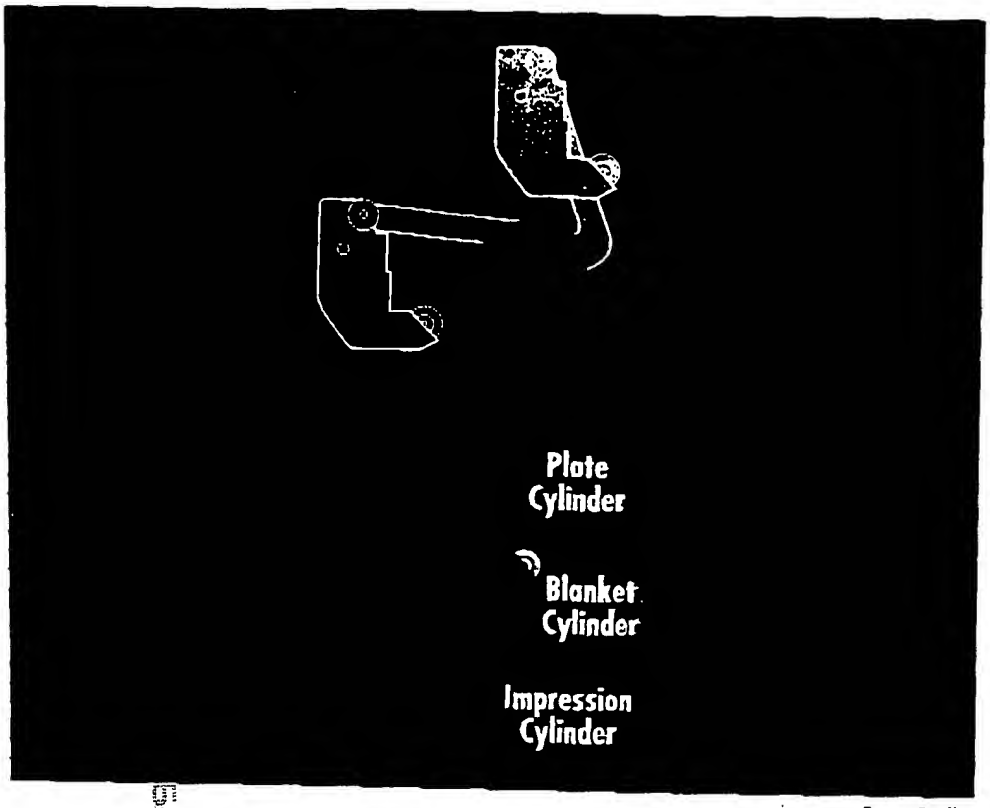


SUPER BLUE

THE EZ PRINT/ COAT FAMILY

MAXIMUM FLEXOBILITY AND A TOUCH OF BRILLIANCE

Add Innovative In-Line Interstation and End of Press Printing Coating.



Patents Pending

The Super Blue EZ Interstation Flexo Printer/Coater is installed directly onto a print unit, for applying any one of a number of aqueous or UV based metallic/opaque inks between print units.

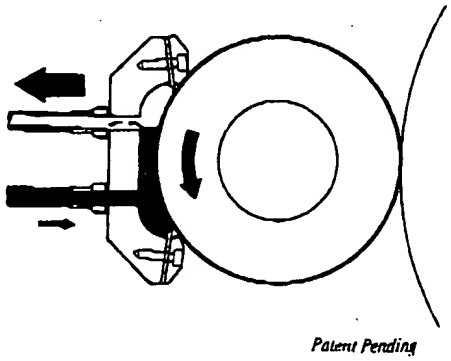
Have you ever wanted to add in-line coating capabilities, metallic, opaque, or other specialized applications to specific print units? Was your decision not to enter this market influenced by mediocre quality, undesirable environmental considerations, or the prohibitive cost?

Search no more ... Your needs and concerns have been resolved!

Printing Research, Inc., invites you to review the patented family of EZ Print/Coat products as described in this brochure. We are confident that you will find the perfect solution to your present and future printing demands.

EZ Interstation Flexo Printer/Coater

The Super Blue EZ Interstation Flexo Printer/Coater is retractable so that it can be swung up and above the print unit for conventional printing or swung into the blanket position to offer complete application variations from job to job. The patented coating head assembly is comprised of two main components. A combination of engraved anilox rolls are offered to provide a consistent overall ink/coating weight. The anilox rolls yield excellent ink/coating release and lay characteristics with no fear of plugging, leaking, or misting due to the unique enclosed doctor blade assembly.

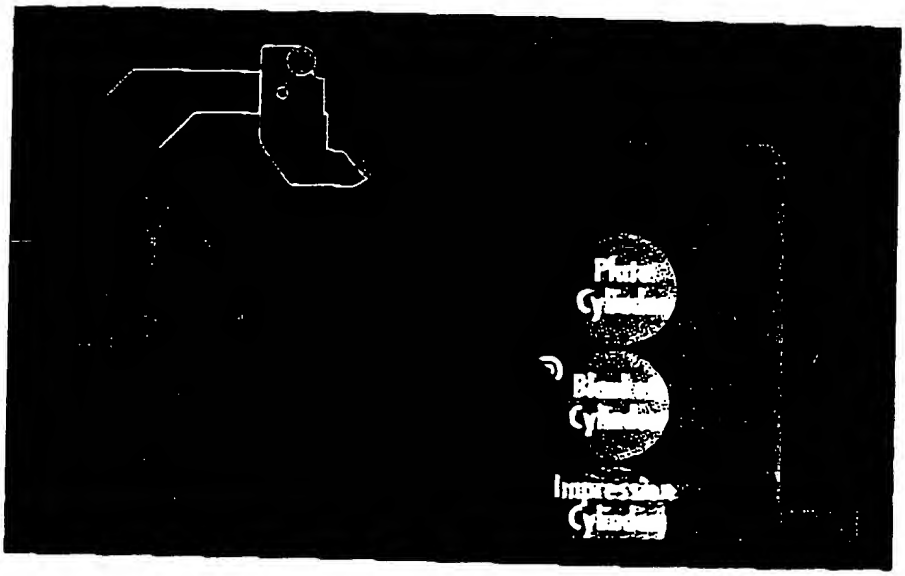


Patent Pending

The EZ Print/Coat Family utilizes a universal coating head configuration for superior ink and coating transfer.

EZ Blanket Coater

The Super Blue EZ Blanket Coater is mounted such that the coating head can be automatically removed from its coating position for conventional use of the last print unit as well as full operator access. Although the EZ Blanket Coater is an end of press retrofit, it offers the same coating release and lay characteristics without fear of plugging, leaking, or slinging due to the same unique enclosed doctor blade assembly.



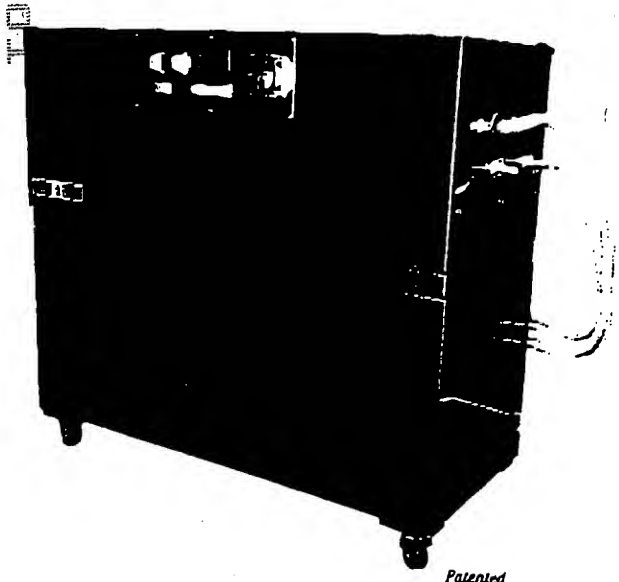
Patented and Patents Pending

The Super Blue EZ Blanket Coater is installed directly onto the delivery or coating/dummy unit of your press for applying any one of a number of aqueous or UV coatings or inks at the last print unit blanket cylinder.

EZ Automatic Pump and Recirculation System

The Super Blue EZ Automatic Pump and Recirculation system is designed to eliminate the headaches associated with other pump systems and complicated wash-up procedures that impact your production time and bottom line. The circulation system is a standard component that allows the operator to push a button and walk away. Whether you are purging, coating, washing-up or by-passing each is fully automated and timed. In addition, the clean-up water reservoir is heated to provide optimum line and head cleaning.

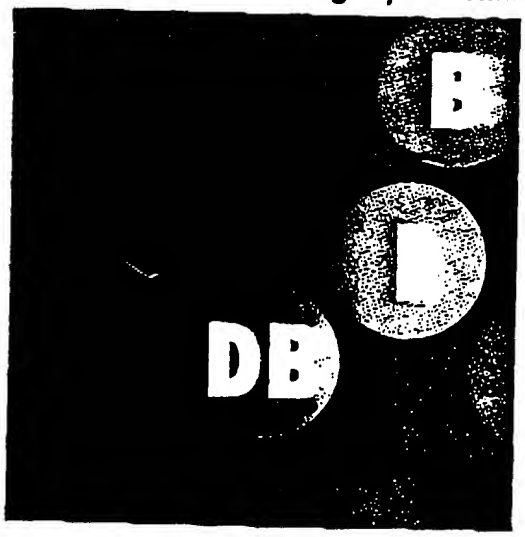
The Super Blue EZ Automatic Pump and Recirculation System is offered as a separate product to suit most anilox coating systems, whether it be a blanket coater, tower coater, flexographic coater or web coater.



Patented

The Super Blue EZ Automatic Pump and Recirculation System is common to the entire EZ Print/Coat Family as a standard component.

The Super Blue EZ Impression Cylinder Coater is installed between the gripper chain rails of the press delivery, but utilizes its own delivery blanket cylinder to add a coating unit without losing a print unit.



Patented

Super Blue® I and II Anti-Marking Systems

Super Blue® BACVAC Vacuum Transfer and Delivery Systems

Super Blue® High Velocity Hot Air Dryers

Super Blue® Air Blanket I and II Infra-Red Drying Systems

Super Blue® Water Cooled and 'Cold' UV Dryers

Super Blue® In-Line and Off-Line Coaters

SUPER BLUE®

Printing Research, Inc.

10954 Shady Trail Dallas, Texas 75220 U.S.A.
Telphone: 214-353-9000
Telex: 794028 Superblue dal
Fax: 214-357-5847
1-800-MARK-LESS
(1-800-627-5537)

Another Fine Product From The Makers Of The Patented Super Blue® System

Super Blue *I and II Anti-Marking Systems*

Super Blue *BACVAC Vacuum Transfer and Delivery Systems*

Super Blue *High Velocity Hot Air Dryers*

Super Blue *Air Blanket I and II Infra-Red Drying Systems*

Super Blue *Water Cooled and 'Cold' UV Dryers*

Super Blue *In-Line and Off-Line Coaters*

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(1-800-627-5537)

Another Fine Product From The Makers Of The Patented Super Blue® System

Instant-drying inks and the elimination of spray powder have been the dream of every printer and printing buyer. The idea was put forward in the 1970's and 80's that it would be possible to print with conventional inks and apply a coating which would dry completely before placement on the delivery stack. This would place a dry skin over the ink, eliminating offsetting, sheet marking and the need for spray powder. The inks dry under the coating.

The advent of the 90's has made the dream a reality. It is now possible to print superior quality with conventional inks and coat the surface in order to deliver a dry, mark-free sheet at full production speeds. This is what the Super Blue products from Printing Research accomplish for you.

Printing Research, Inc.

10954 Shady Trail   Dallas, Texas 75220   U.S.A.

Telephone 214-353-9000
Telex 794028 Superblue dal
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Patented

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Telephone 214-353-9000
Telex 794028 Superblue dal
Fax 214-357-5847

Patented

Printing Research, Inc.
"Mark-less" Super Blue®

May 12, 1995

Mr. Jerry Williamson
Williamson Printing Corp.
6700 Denton Drive
Dallas TX 75235-4497

Dear Jerry,

It was a great pleasure for Steve Garner and me to meet with you, Jesse Williamson and Bill Davis. The following confirms our discussion:

1. **EZ Interstation Flexo Printer/Coater**

   A. Lithoflex as used by PRI to describe its EZ Printer/Coater process is not in conflict with WPC.

   B. PRI is preparing comment for an upcoming coating article in Graphic Arts Monthly relative to the EZ Printer/Coater family, as well as a presentation for the GATF Sheetfed Conference June 25-27, 1995. Both GAM and GATF would like input from WPC. We are suggesting that they both contact you direct.

   C. An order for one Super Blue EZ Interstation Flexo Printer/Coater (your PO 3315) for installation on the first printing unit of your Heidelberg Speedmaster CD 6+LYL is in hand. We anticipate delivery to be approximately 90 days. The price of the coater is to be negotiated. WPC will continue to use PRI's experimental coater installed on the Heidelberg Speedmaster CD 7+L press until PRI has delivered and installed the EZI.

   D. A separate discussion document addressing exclusivity is attached.

2. **Heidelberg Speedmaster CD 6+LYL (Press #3)**

   A. Gloss readings have been taken of the spot water based primer UV overcoat printing job that had various products (golf club, sports shoe, electrical connectors, etc.). The findings are as follows:
      1. Highlight areas -- 97 points (toe of shoe)
      2. Heavy black solids -- 74 points (electrical connectors)
      3. Solid blue -- 84 points (credit card)

We all concluded that this was a classic case of dry back and that we should press forward with the installation of HV on this press to alleviate such dry back problems and also to dry metallic or specialist water based inks in the future.

10954 Shady Trail Dallas, Texas 75220 U.S.A. Telephone 214-353-9000 Telex 794028 Superblue dal Fax 214-357-5847

B. The UV lamps in the upsweep of the delivery are to be moved to the lower last horizontal aperture in the extended delivery to:
   1. Minimize spray powder contamination when running spot UV applications
   2. Minimize the effects of sheet flutter on the cure of UV coatings. This needs to be carried out as soon as is convenient to WPC.

3. **Heidelberg Speedmaster CD 8+L (Press #5)**

A. This press is to be supplied UV ready for maximum flexibility. All indications up to this point are that the water based flexo metallic, even when thoroughly dry, will be prone to pile and back trap when applied on early units of a press. The application of UV metallic appears to overcome this problem. The installation of UV throughout would enable WPC to print litho, flexo on any unit, assuming EZ Flexo Printer Coaters were installed, on any substrate at maximized press speeds.

B. PRI is to furnish WPC with a proposal for an 11 lamp 'Cold' UV system for this press.

4. **Web Offset 38 Inch UV Coating System**

A. PRI is to arrange a visit for WPC to Sheffer's installation of a UV coater on a Heidelberg Harris M1000 in Portland, Tennessee.

B. PRI is to prepare a proposal for a joint Sheffer/PRI coater package for installation on WPC's newly proposed press.

We look forward to a continued successful partnership.

Sincerely yours,

John Bird

John Bird
Product Manager

JB:ln

Enclosures:

cc: Jesse Williamson/Williamson Printing Corp.
Bill Davis/Williamson Printing Corp.
Bob Emrick/Williamson Printing Corp.
Steve Garner/PRI
Steve Baker/PRI

WPC/PRI PARTNERING AGREEMENT FOR THE SUPER BLUE EZ INTERSTATION FLEXO PRINTER/COATER

1. PRI agrees to manufacture and supply one Super Blue EZ Interstation Flexo Printer/Coater (PO #3315) on an exclusive basis.

2. Exclusive is to be interpreted to mean that PRI will not supply to printers in the commercial litho offset printing market for a period and territory to be defined.

3. Exclusions include the litho offset printing markets of folding carton, label, and greeting cards.

   A. North America, including Mexico and Canada, will be exclusive to WPC for ~~6~~ 12 months from the date of delivery of the EZ Interstation Flexo Printer/Coater (PO #3315).

   B. Texas and its contiguous states (Louisiana, Arkansas, Oklahoma, New Mexico) and including Arizona and Colorado will be exclusive for a further 6 months, equaling 12 months from the date of delivery of the EZ Interstation Flexo Printer/Coater.

4. PRI defines 6 months and 12 months exclusivity 3A and 3B to mean PRI will not accept an order for a Super Blue EZ Interstation Flexo Printer/Coater for installation on a printing unit prior to the last printing unit of a press.

5. PRI may request during the term of this agreement to supply to other commercial printers and WPC may not unreasonably decline.

(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 741 025 A3

(12) EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
28.05.1997 Bulletin 1997/22

(43) Date of publication A2:
06.11.1996 Bulletin 1996/45

(21) Application number: 96303136.4

(22) Date of filing: 03.05.1996

(51) Int. Cl.[6]: B41F 31/30, B41F 5/24, B41F 23/08

(84) Designated Contracting States:
DE FR GB IT SE

(30) Priority: 04.05.1995 US 435798

(71) Applicant: DeMoore, Howard W.
Dallas, Texas 75220 (US)

(72) Inventors:
- DeMoore, Howard W.
Dallas, Texas 75220 (US)
- Rendleman, Ronald M.
Dallas, Texas 75229 (US)
- Bird, John W.
Carrollton, Texas 75007 (US)

(74) Representative: Gura, Henry Alan et al
MEWBURN ELLIS
York House
23 Kingsway
London WC2B 6HP (GB)

(54) Retractable inking/coating apparatus having ferris movement between printing units

(57) A retractable in-line inking/coating apparatus (10) selectively applies either spot or overall ink/coating material to a blanket (B) or flexographic plate (P) on a blanket cylinder (34), or spot or overall ink/coating to a flexographic printing plate (P) on a plate cylinder (32) in a rotary offset printing press (12). The inking/coating apparatus is pivotally mounted on a printing unit (22, 24, 26, 28) or dedicated coating unit, and is extendable into and retractable out of an operative inking/coating position by a carriage assembly (58) which is pivotally coupled to the printing unit. Because of the pivotal support provided by a cantilevered support arm (88, 90), the inking/coating apparatus is extended and retracted through a Ferris wheel arc between adjacent printing units.

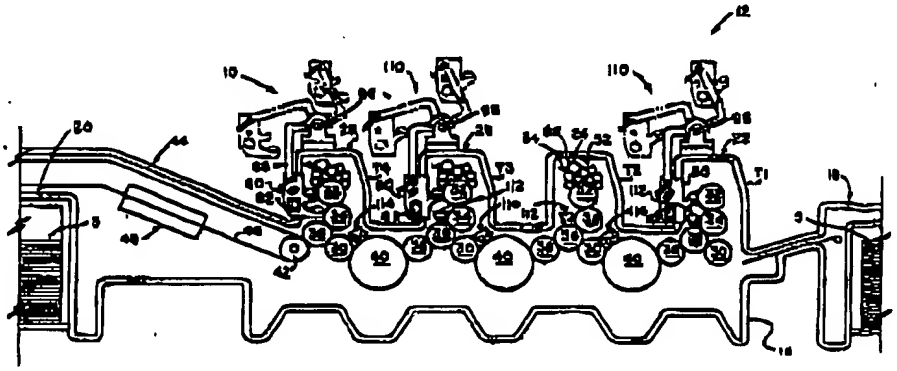

FIG. 1

EP 0 741 025 A3

Printed by Rank Xerox (UK) Business Services
2.14.3/3.4

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 96 30 3136

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X Y	US 4 841 903 A (BIRD) * abstract; claims; figure 1 *	1,15-17 4-6,8,9, 13	B41F31/30 B41F5/24 B41F23/08
X	US 5 107 790 A (SLIKER ET AL.) * abstract; claim 1; figures * * column 2, line 9 - line 22 *	1,18	
Y	US 5 335 596 A (DEMOORE ET AL.) * abstract; figures 1-4 * * column 7, line 32 - line 58 *	4,5,8,9	
Y	US 4 617 865 A (SWITALL) * abstract; figures 1-3 * * column 6, line 9 - line 42 *	6	
Y	US 4 825 804 A (DIRICO ET AL.) * abstract; figures 2,3 * * column 3, line 10 - line 21 *	13	
A	EP 0 647 524 A (DEMOORE) * abstract; figures 1,2,5 * * column 4, line 32 - line 40 *	15-22	TECHNICAL FIELDS SEARCHED (Int.Cl.6) B41F
A	PAPIER + KUNSTSTOFF VERARBEITER, vol. 26, no. 6, 1 June 1991, page 129 XP000232825 "LACKIER-AGGREGAT FUER SPEEDMASTER-MASCHINEN"	1	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	20 March 1997	Helpiö, T

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 741 025 A2

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Dallas, Texas 75220 (US)

(72) Inventors:
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- **Rendleman, Ronald M.**
Dallas, Texas 75229 (US)
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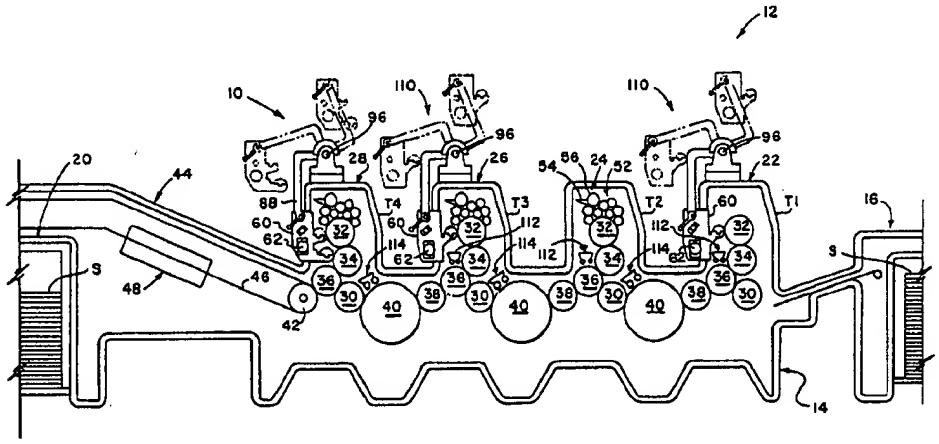


FIG. 1

EP 0 741 025 A2

Description

This invention relates to sheet-fed or web-fed, rotary offset or flexographic printing presses, and more particularly, to a new and improved inking/coating apparatus for the in-line application of printing inks or protective or decorative coatings to sheet or web substrates.

Conventional sheet-fed, rotary offset printing presses typically include one or more printing units through which individual sheets are fed and printed with wet ink. Since the inks used with rotary offset printing presses typically remain wet and tacky for some time after printing, special precautions must be taken to insure that the freshly printed sheets are not marked or smeared as the sheets are transferred from one printing unit to another, and while being conveyed to the sheet delivery stacker. The printed surface of the freshly printed sheet dries relatively slowly and can be smeared during subsequent transfer between printing units. In order to reduce smearing and offsetting, spray powder is applied on the printed sheet.

In some printing applications, offset and smearing are prevented by applying a protective and/or decorative coating over all or a portion of the freshly printed sheets. Various arrangements have been proposed for applying the protective or decorative coating as an in-line operation by using the last printing unit of the press as the coating application unit. However, when such in-line coating is performed, the last printing unit cannot be used to apply ink to the sheets, and can only be used for the coating operation. Thus, while coating with these types of in-line coating apparatus, the press loses the capability of printing its full range of colors since the last printing unit is converted to a coating unit.

It will be appreciated that the time required to reconfigure a press for coating or non-coating is non-productive and costly. Accordingly, there is a need for an in-line coating apparatus that minimizes the time to clean-up from one printing run and set-up and run the next job. Where consecutive jobs require the same type of coating, particularly blanket coating, it may not be necessary to clean-up the coater between jobs. However, the coating material cannot be allowed to dry on the rollers. Therefore, especially when switching from blanket to spot coating or vice versa, or if there is a delay between jobs, it is necessary to wash-up the coater after each job is completed.

In addition, coater wash-up is necessary when switching between different coating compositions, such as aqueous and ultra violet (UV) curable coatings. Such coating materials are not interchangeable, and consequently, the coater must be washed between applications of different coating media.

The foregoing limitations are overcome, according to the present invention, by a retractable, in-line inking/coating apparatus which is mounted on a printing unit for pivotal, Ferris wheel movement between an operative inking/coating position and a retracted, overhead idle position. The inking/coating apparatus includes an applicator head which, is positioned in alignment with either the plate cylinder or the blanket cylinder by a carriage assembly which includes a cantilevered support arm. The support arm is pivotally coupled between the inking/coating head and the printing unit tower. This cantilevered, pivotal mounting arrangement allows the inking/coating unit to be used between two printing units, as well as on the last printing unit of the press.

In the preferred embodiment, the applicator head includes vertically spaced pairs of cradle members with one cradle pair being adapted for supporting a metal or ceramic coating roller in alignment with a blanket cylinder, and the other cradle pair supporting a resilient anilox coating roller in alignment with the plate cylinder, respectively, when the carriage assembly is in the operative position. Because of the cantilevered, pivotal support provided by the support arm, the applicator head can be lifted and lowered through an arc, similar to Ferris wheel movement, in the limited space between adjacent printing units. When fully retracted, the applicator head and carriage assembly are lifted to an elevated, retracted overhead position, preferably an overhead position overlying the printing unit tower, thus providing complete access to the interstation space and the printing unit cylinders without causing the printing unit to lose its printing capability. The inking/coating applicator roller of the applicator head can be inspected, cleaned or replaced and the doctor blade assembly can be washed-up automatically while the inking/coating apparatus is in the retracted position.

When the inking/coating apparatus is used in combination with a flexographic printing plate and aqueous ink or aqueous coating, the water component of the aqueous ink or coating on the freshly printed sheet is evaporated by a high velocity, hot air interstation dryer and a high volume heat and moisture extractor assembly so that the freshly printed ink or coating is completely dry before the sheet is printed on the next printing unit. This quick drying flexographic printing/coating arrangement permits a base coat of ink, for example opaque white or metallic ink (gold, silver or other metallics) to be applied in the first printing unit, and then overprinted by a lithographic process on the next printing unit.

Exemplary embodiments of the present invention are illustrated in the drawing figures wherein:

FIGURE 1 is a schematic side elevational view of a sheet-fed, rotary offset printing press having inking/coating apparatus embodying the present invention;

FIGURE 2 is a perspective view of the printing press of FIGURE 1 in which a dual head inking/coating apparatus is in the operative coating position and a single head coater is in a retracted, overhead position;

FIGURE 3 is an enlarged simplified perspective view showing one side of the single head ink-

ing/coating apparatus of FIGURE 1 in the operative position;

FIGURE 4 is a simplified side elevational view showing the dual head inking/coating apparatus in the operative coating position for spot or overall coating from the blanket position;

FIGURE 5 is a simplified side elevational view showing the single head inking/coating apparatus in the operative coating position for spot or overall coating from the plate position; and,

FIGURE 6 is a simplified side elevational view of the dual head inking/coating apparatus of FIGURE 4, partially broken away, which illustrates the hydraulic drive assembly and doctor blade assembly.

As used herein, the term "processed" refers to various printing methods which may be applied to either side of a substrate, including the application of UV-curable and aqueous inks and/or coatings. The term "substrate" refers to sheet or web material. Also, as used herein, the term "waterless printing plate" refers to a printing plate having non-image surface areas which are hydrophobic and also having image surface areas which are hydrophilic, wherein the non-image surface areas are characterized by a surface tension value which is less than the surface tension of aqueous ink, and the image surface areas are characterized by a surface tension value which is greater than the surface tension of aqueous ink. "Flexographic" refers to flexible printing plates having a relief surface which is wettable by aqueous ink or aqueous coating material.

As shown in the exemplary drawings, the present invention is embodied in a new and improved in-line inking/coating apparatus 10, for applying inks or protective and/or decorative coatings to sheets or webs printed in a sheet-fed or web-fed, rotary offset or flexographic printing press, herein generally designated 12. In this instance, as shown in FIGURE 1, the inking/coating apparatus 10 is installed in a four color printing press 12, such as that manufactured by Heidelberger Druckmaschinen AG of the Federal Republic of Germany under its designation Heidelberg Speedmaster 102V. The press 12 includes a press frame 14 coupled at one end, herein the right end, to a sheet feeder 16 from which sheets, herein designated S, are individually and serially fed into the press, and at the opposite end, with a sheet delivery stacker 20 in which the freshly printed sheets are collected and stacked. Interposed between the sheet feeder 16 and the sheet delivery stacker 20 are four substantially identical rotary offset printing units 22, 24, 26 and 28 which can print different color inks onto the sheets as they are transferred through the press 12. The printing units are housed within printing towers T1, T2, T3 and T4 formed by side frame members 14, 15.

As illustrated, the printing units 22, 24, 26 and 28 are substantially identical and of conventional design. The first printing unit 22 includes an in-feed transfer cylinder 30, a plate cylinder 32, a blanker cylinder 34 and an impression cylinder 36, all supported for rotation in parallel alignment between the press side frames 14, 15. Each of the first three printing units 22, 24 and 26 have an interunit transfer cylinder 38 disposed to transfer the freshly printed sheets from the adjacent impression cylinder to the next printing unit via an interstation transfer cylinder 40. The last printing unit 28 is shown equipped with a delivery cylinder 42 which guides each freshly printed sheet 18 as it is transferred from the last impression cylinder 36 to a delivery conveyor system, generally designated 44, to the sheet delivery stacker 20.

The delivery conveyor system 44 as shown in FIGURE 2 is of conventional design and includes a pair of continuous delivery gripper chains 46, only one of which is shown carrying at regular spaced locations along the chains, laterally disposed gripper bars having gripper fingers for gripping the leading edge of a freshly printed sheet 18 after it leaves the nip between the delivery cylinder 42 and impression cylinder 36 of the last printing unit 28. As the leading edge is gripped by the grippers, the delivery chains 46 pull the freshly printed sheet away from the impression cylinder 36 and deliver the freshly printed sheet to the sheet delivery stacker 20.

Prior to reaching the delivery sheet stacker, the freshly printed and/or coated sheets S pass under a delivery dryer 48 which includes a combination of infrared thermal radiation, high velocity hot air flow and heat and moisture extraction for drying the ink and/or the protective/decorative coating on the freshly printed sheets.

In the exemplary embodiment shown in FIGURE 1, the first printing unit 22 is equipped with a flexographic printing plate, and does not require an inking roller train or a dampening system. If an ink roller train is mounted on the first printing unit, the form rollers are retracted and locked off when the printing unit goes on impression. Flexographic aqueous ink is supplied by the inking/coating unit 110. The remaining printing units 24, 26 and 28 are equipped for lithographic printing and include an inking apparatus 50 having an inking roller train 52 arranged to transfer ink from an ink fountain 54 to the plate cylinder 32. This is accomplished with the aid of a fountain roller 56 and a ductor roller. The fountain roller 56 projects into the ink fountain 54, whereupon its surface is wetted with printing ink Q. The printing ink Q is transferred intermittently to the inking roller train 52 by the ductor roller. The inking roller train 52 supplies printing ink Q to the image ares of a printing plate P mounted on the plate cylinder 32.

The printing ink Q is transferred from the printing plate P to an ink receptive blanket B which is mounted on the blanket cylinder 34. The inked image carried on the blanket B is transferred to a sheet S as the sheet is transferred through the nip between the impression cylinder 36 and the blanket B.

The inking roller arrangement 52 illustrated in FIGURE 1 is exemplary for use in combination with lithographic ink printing plates. It will be understood that

dampening rollers (not illustrated) will be in direct engagement with the lithographic plate P, but are not used in combination with the flexographic plate of printing unit 22.

Referring now to FIGURE 4, FIGURE 5 and FIGURE 6, the in-line inking/coating apparatus 10 includes a carriage assembly 58 which supports an applicator head 60. The applicator head 60 includes a hydraulic motor 62, a lower gear train 64, an upper gear train 65, an applicator roller 66 and a doctor blade assembly 68. The external peripheral surface of the applicator roller 66 is inserted into wetting contact with liquid coating material or ink contained in a reservoir 70. The reservoir 70 is continuously supplied with ink or coating which is circulated through the reservoir 70 from an off-press source by a pump (not illustrated). The hydraulic motor 62 drives the applicator roller 66 synchronously with the plate cylinder 32 and the blanket cylinder 34 in response to an RPM control signal from the press drive (not illustrated) and a feedback signal developed by a tachometer 72. While a hydraulic drive motor is preferred, an electric drive motor can be used.

The applicator roller 66 is preferably a fluid metering anilox roller which transfers measured amounts of printing ink or coating material onto the printing plate or blanket. The surface of an anilox roller is engraved with an array of closely spaced, shallow depressions referred as "cells". Ink or coating material from the reservoir 70 flows into the cells as the anilox roller turns through the reservoir. The transfer surface of the anilox roller is scraped with a doctor blade 73 to remove excess ink or coating. The ink or coating remaining on the anilox roller is the measured amounts contained within the cells.

The applicator roller 66 is cylindrical and may be constructed in various diameters and lengths, containing cells of various sizes and shapes. The volumetric capacity of an anilox roller is established during manufacturing and is dependent upon the selection of cell size, shape and number of cells per unit area. Depending upon the intended application, the cell pattern may be fine (many small cells per unit area) or coarse (fewer larger cells per unit area).

By applying the ink or coating material through the inking/coating applicator head 60, more ink or coating material can be delivered to the sheet S as compared with the inking roller train of a lithographic printing unit. Moreover, color intensity is stronger and more brilliant because the flexographic ink is applied at a much larger film thickness than can be applied by the lithographic process and is not diluted by dampening solution.

The inking/coating applicator head 60 includes side frame members 74, 76 that support the applicator roller 66, gear train 64, gear train 65, doctor blade assembly 68 and the drive motor 62. The applicator roller 66 is supported at opposite ends on a lower cradle formed by a pair of end plates 78, 80 which hold the applicator roller 66 in parallel alignment with the blanket cylinder 34 (FIGURE 5). The side frames 74, 76 are also provided with an upper cradle formed by a pair of side plates 82, 84 which are vertically spaced with respect to the lower side plates 78, 80. Each cradle has a pair of sockets 79, 81 and 83, 85, respectively, for holding the applicator roller 66 for spot coating or inking engagement against the plate P of the plate cylinder 32 (FIGURE 4) or the blanket B of the blanket cylinder 34.

Preferably, the applicator roller 66 for the upper cradle (plate) position is an anilox roller having a resilient transfer surface. In the dual cradle arrangement, the press operator can quickly change over from blanket inking/coating and plate inking/coating with minimum press down time, since it is only necessary to remove and reposition or replace the applicator roller 66, and wash-up the doctor blade assembly if changing from ink to coating or vice versa. The capability to selectively operate in either the flexographic mode or the lithographic mode and to print or coat from either the plate or blanket position is referred to herein as the "LITHOFLEX" process.

Referring again to FIGURE 2 and FIGURE 3, the applicator head 60 is supported by the carriage assembly 58 in a cantilevered, pivotal arrangement which allows the dual cradle inking/coating apparatus 10 and a single cradle inking/coating apparatus 110 to be used between any two adjacent printing units, as well as used on the first and last printing units of the press. This is made possible by a pair of cantilevered support arms 88, 90 that are pivotally coupled to the side plates 74, 76, respectively, on a pivot shaft 77. Each support arm has a hub portion 88A, 90A, respectively, and an elongated shank portion 88B, 90B, respectively.

The cantilevered support arms are pivotally mounted on the printing tower by pivot blocks 92, 94, respectively. The hub portions 88A, 90A are journalled for rotation on pivot shafts 96, 98, respectively. The pivot blocks 92, 94 are securely fastened to the tower 14D, so that the carriage assembly 86 is pivotally suspended from the pivot shafts 96, 98 in a cantilevered Ferris support arrangement. The shank portions 88B, 90B are pivotally coupled to the pivot shaft 77, so that the carriage assembly 58 and the applicator head 60 are capable of independent rotation with respect to each other and with respect to tee pivot shaft 77. By this arrangement, the applicator head 60 is pivotally suspended from the pivot shaft 77, and remains in an upright orientation as the support arms rotate from the operative position to the fully retracted position, and vice versa.

Thus, the cradles 78, 80 and 82, 84 position the applicator roller 66 in vertical and horizontal alignment with the plate cylinder or blanket cylinder when the applicator head is extended to the operative position, for example as shown in FIGURE 4 and FIGURE 5. Moreover, because of the transverse relationship between the hub portion and shank portion of the support arms, the applicator head 60 and carriage assembly 58 are capable of rotating through a Ferris arc without touching the adjacent printing tower. This makes it possible to install the inking/coating apparatus 10 on any intermedi-

ate printing unit tower (T2, T3), and as well as on the first printing unit tower T1 and the last printing unit tower T4. Additionally, when the inking/coating unit 10 is in the operative position, the lateral projection of the applicator head 60 into the interstation space between printing units is minimized. This assures virtually unrestricted operator access to the interstation space between adjacent printing units when the applicator head is engaged in the operative position, and completely unrestricted access when the carriage assembly 58 is retracted.

Rotation of the carriage assembly 58 is counterclockwise from the retracted, idle position (shown in phantom in FIGURE 1) to the operative position (FIGURE 4 and FIGURE 5). The carriage assembly 58 can be adapted for clockwise rotation from the retracted position to the operative position for engagement of the applicator roller to either the plate or the blanket on the dampener side of the tower, assuming that access to the plate and blanket is not restricted by dampener rollers or the like.

Rotational movement of the support arms 88, 90 is assisted by counterweights 100, 102 which are secured to the support arms, respectively, for concurrent rotation with respect to the pivot blocks 92, 94. With the passive assistance of the counterweights, the press operator can easily move the inking/coating assembly 10 from the engaged operative position as shown in FIGURE 4 to the fully retracted, idle position as shown in phantom in FIGURE 1. Preferably, rotation of the carriage assembly 58 is assisted by a torsion spring, electric motor or hydraulic motor.

The inking/coating apparatus 10 is releasably locked into the operative position as shown in FIGURE 4 by releasable latch couplings 103, 105 that secure the support arms 88, 90 to the press side frames 14, 15, respectively, of the printing unit tower T4 in the operative position. Coating engagement of the applicator roller 66 against the blanket cylinder 34 is produced by power actuators, preferably pneumatic cylinders 104, 106 which have extendable/retractable power transfer arms 104A, 106A, respectively. The pneumatic cylinder 104 is pivotally coupled to the support arm 88 by a pivot linkage 108, and the second pneumatic cylinder 106 is pivotally coupled to the support arm 90 by a pivot linkage 109. In response to actuation of the pneumatic cylinders 104, 106, the power transfer arms are retracted. As the transfer arms retract, the inking/coating head 60 is rotated counterclockwise on the pivot shaft 77, thus moving the applicator roller 66 into coating engagement with the blanket cylinder 34.

The pivot linkage 108 includes a bell crank 111 which is mounted for pivotal movement on a pin 113. The pin 113 is supported by a clevis plate 115 which is attached to the support arm 88. One end of the bell crank is pivotally coupled to the actuator arm 104A, and a cam roller 117 is mounted for rotation on its opposite end.

The cam roller 117 is engagable against an adjustable stop 119 which is rigidly secured to the side plate 74. Counterclockwise shifting of the handle H moves a cam follower 121 into a latch pocket 123 of a receiver block 125 as the cam roller 117 is moved into engagement with the adjustable stop 119 in the interlocked, operative position. Referring to FIGURE 4, FIGURE 5 and FIGURE 6, the receiver block 125 is secured to the delivery side of the printing unit tower by machine screws.

When the plate P goes on impression, power is applied to the pneumatic actuator 104 and the power transfer arm 104A retracts, thus causing the bell crank 111 to rotate counterclockwise about the pin 113. The torque applied by the pneumatic actuator 104 is transmitted to the applicator head 60 through the cam roller 117 and the adjustable stop 119. Counterclockwise movement of the applicator head 60 relative to the support shaft 77 carries the applicator roller 66 into engagement with the plate P.

The adjustable stop 119 has a threaded bolt 119A which is engagable with the cam roller 117. The striking point of engagement is preset so that the applicator roller 66 is properly positioned for engagement with the plate P or blanket B in the operative position when the applicator head 60 is interlocked with the press frame 14 and the printing unit goes on impression.

Referring to FIGURE 5, an inking/coating apparatus 110 having a single head is illustrated. The construction of this alternative embodiment is identical in all respects with the dual head arrangement, with the exception that only a single gear train and a single cradle for holding the applicator roller is provided. In both embodiments, the inking/coating head 60 remains upright as it swings through an arc, comparable to the movement of a Ferris wheel. Because of the upright orientation of the inking/coating head 60 as it moves between the extended and retracted positions, the usual platform spacing between printing unit towers provides adequate clearance to permit extension and retraction of the carriage assembly 58 without interference with operator access to the printing units. This is a significant advantage in that it permits the in-line inking/coating apparatus 10 to operate effectively in the interstation space between any adjacent printing units, and without blocking or obstructing access to the cylinders of the printing units when the inking/coating apparatus is in the retracted position (as indicated in phantom in FIGURE 1).

Moreover, when the in-line inking/coating apparatus is in the fully retracted position, the applicator roller 66 is conveniently positioned on the dampener side of the printing unit for inspection, clean-up or replacement. Additionally, the doctor blade assembly is also conveniently positioned for inspection, removal, adjustment or clean-up. Also, the doctor blade reservoir and coating circulation lines can be cleaned while the press is running as well as when the press has been stopped for change-over from one type of ink or coating material to another.

When the inking/coating apparatus is used for applying an aqueous ink or an aqueous coating material, the water component on the freshly printed sheet S is evaporated by a high velocity, hot air interstation dryer and high volume heat and moisture extractor units 112 and 114, as shown in FIGURE 1, FIGURE 4 and FIGURE 5. The dryer/extractor units 112 and 114 are oriented to direct high velocity heated air onto the freshly printed/coated sheets as they are transferred by the interunit and the intermediate transfer cylinders 36, 40. By this arrangement, the freshly printed aqueous ink or coating material is completely dry before the sheet is overprinted in the next printing unit.

The high velocity, hot air dryer and high performance heat and moisture extractor units 112, 114 utilize high velocity air jets which scrub and break-up the moist air level which clings to the surface of each freshly printed sheet. Within each dryer, high velocity air is heated to a high temperature as it flows across a resistance heating element within an air delivery baffle tube. High velocity jets of hot air are discharged through multiple airflow apertures through an exposure zone Z (FIGURE 4 and FIGURE 5) onto the freshly printed/coated sheet S as it is transferred by the transfer cylinder 36 and intermediate transfer cylinder 40, respectively. Each dryer assembly includes a pair of air delivery dryer heads which are arranged in spaced, side-by-side relation as shown in FIGURE 4 and FIGURE 5.

The high velocity, hot moisture-laden air displaced from each freshly printed sheet is extracted from the dryer exposure zone Z and completely exhausted from the printing unit by the high volume extractors. Each extractor head includes a manifold coupled to the dryer heads and draws the moisture, volatiles and high velocity hot air through a longitudinal gap between the dryer heads. According to this arrangement, each printed sheet is dried before it is run through the next printing unit.

The water-based inks used in flexographic printing dry at a relatively moderate drying temperature provided by the interstation high velocity hot air dryers/extractors 112, 114. Consequently, print quality is substantially improved since the aqueous ink is dried at each printing unit before it enters the next printing unit. Moreover, back-trapping on the blanket of the next printing unit is completely eliminated. This interstation drying arrangement makes it possible to print aqueous inks such as metallic ink and opaque white ink at one printing unit, and then overprint at the next printing unit.

This arrangement also permits the first printing unit to be used as a coater in which an aqueous coating is applied to low grade paper, for example recycled paper, to trap and seal in lint, dust, spray powder and other debris and provide a smoother, durable surface that can be overprinted in the next printing unit. The first down coating seals the surface of the low grade, rough substrate and improves overprinted dot definition while preventing strike-through and show-through. A UV-curable protective and/or decorative coating can be applied over the first down overprinted (aqueous) coating in the last printing unit.

Preferably, the applicator roller 66 is constructed of metal or ceramic when it is used for applying a coating material to the blanket B on the cylinder 34. When the applicator roller 66 is applied to the plate, it is preferably constructed as an anilox roller having a resilient transfer surface for engaging a flexographic printing plate. Suitable resilient roller surface materials include Buna N synthetic rubber and EPDM (terpolymer elastomer).

It will be appreciated that the inking/coating apparatus 10 is capable of applying a wide range of ink types, including fluorescent (Day Glo), pearlescent, metallics (gold, silver and other metallics), glitter, scratch and sniff (micro-encapsulated fragrance), scratch and reveal, luminous, pressure-sensitive adhesives and the like.

The press operator can eliminate the dampener roller assembly altogether, and the inking/coating apparatus 10 can selectively apply aqueous inks and coatings to a flexographic or waterless printing plate and the blanket. Moreover, overprinting of the aqueous inks and coatings can be carried out in the next printing unit since the aqueous inks and coatings are completely dried by the high velocity, hot air interstation dryer and high volume heat and moisture extractor assembly.

The aqueous inks and coatings as used in the present invention contain colored pigments and/or soluble dyes, binders that fix the pigments onto the surface of the printed sheet, and waxes, defoamers and thickeners. Aqueous printing inks predominantly contain water as a solvent, diluent and/or vehicle. The thickeners which are preferred include algonates, starch, cellulose and its derivatives, for example cellulose esters or cellulose ethers and the like. Coloring agents including organic as well as inorganic pigments may be derived from dyes which are insoluble in water. Also, the printing ink may contain water and can be predominantly glycol or the like, with the pigment being bound by an appropriate resin. When metallic inks are printed, the cells of the anilox roller must be appropriately sized to prevent the metal particles from getting stuck within the cells. The cell size is critical, and for metallic gold ink, the anilox roller should have a screen line count in the range of 175-300 lines per inch (69-118 lines per cm).

The inking/coating apparatus 10 can also apply UV-curable inks and coatings. If UV-curable inks and coatings are utilized, ultra-violet dryers/extractors are installed adjacent the high velocity hot air dryer/extractor units 112, 114, respectively.

It will be appreciated that the inking/coating apparatus 10 described herein makes it possible to selectively operate a printing unit in either the flexographic printing mode or the lithographic printing mode, while also providing the capability to print or coat from either the plate or blanket position. The dual cradle support arrangement of the present invention makes it possible to quickly change over from inking/coating at the blanket

cylinder position to inking/coating at the plate cylinder position with minimum press down-time, since it is only necessary to remove and reposition or replace the applicator roller 66 while the printing/inking apparatus is in the retracted position.

Moreover, the press operator may elect to spot or overall coat with aqueous ink/coating from the plate during one job, and then spot and/or overall coat from the blanket during the next job. Since the doctor blade assembly can be flushed and washed-up quickly and the applicator roller can be replaced quickly, it is possible to spot coat or overall coat from the plate position or the blanket position with aqueous inks or coatings during the first press run and then spot coat or overall coat with UV-curable inks or coatings from the plate position or from the blanket position during the next press run. The inking/coating apparatus 10 is completely out of the way in the retracted position; consequently, the doctor blade reservoir and supply lines can be flushed and washed-up by automatic wash-up equipment while the printing unit is printing another job.

The positioning of the applicator head and roller assembly relative to the plate and blanket is repeatable to a predetermined, preset impression position. Consequently, no printing unit adjustment or alteration is required, except for flushing the doctor blade assembly and cleaning or replacing the applicator roller to accommodate a different kind of ink or coating material. Although manual extension and retraction have been described in connection with the exemplary embodiment, extension to the operative position and retraction to a non-operative idle position can be carried out automatically by hydraulic or electric motor servomechanisms.

The Ferris wheel support arrangement allows the inking/coating apparatus to operate effectively in the interstation space between any adjacent printing units, as well as on the first or last printing units of the press, without blocking or obstructing the interstation space or restricting operator access to the cylinders of any of the printing units.

Finally, because the inking/coating apparatus of the present invention is mounted on a printing unit tower and is extendable to the operative position without requiring adjustment or alteration of the printing unit cylinders, it can be used for applying printing ink or coating material to the blanket cylinder of a rotary offset web press, or to the blanket of a dedicated coating unit.

Claims

1. Inking/coating apparatus (10) for use in a printing press (12) of the type having a printing unit (22, 24, 26, 28) on which a plate cylinder (32), a blanket cylinder (34) and an impression cylinder (36) are mounted for rotation, wherein the inking/coating apparatus is characterized by:

   an applicator head (60) for applying ink or coating material to a plate (P) mounted on the plate cylinder or to a blanket (B) mounted on the blanket cylinder, either separately or simultaneously when the inking/coating apparatus is in an operative position relative to the plate and blanket cylinders; and,

   a carriage assembly (58) for moving the applicator head to the operative position in which the applicator head is disposed laterally adjacent to the plate and blanket cylinders and for moving the applicator head from the operative position to a retracted position in which the applicator head is elevated with respect to the plate and blanket cylinders.

2. Inking/coating apparatus (10) as set forth in claim 1, wherein the carriage assembly (58) is characterized by:

   a support arm (88, 90) having a first end portion (88A) constructed for pivotal attachment to the printing unit and having a second end portion (88B) pivotally coupled to the applicator head (60), the applicator head being movable on the support arm to the operative position.

3. Inking/coating apparatus (10) as set forth in claim 1, characterized in that a counterweight (100, 102) is coupled to the carriage assembly.

4. Inking/coating apparatus (10) as set forth in claim 1, wherein the applicator head (60) is characterized by:

   a doctor blade assembly (68) having a reservoir (70) for receiving ink or liquid coating material; and,

   an applicator roller (66) coupled to the doctor blade assembly in fluid communication with the reservoir, the applicator roller being engagable with a printing plate (P) on the plate cylinder or with a blanket (B) on the blanket cylinder when the applicator head (60) is in the operative position.

5. Inking/coating apparatus (10) as set forth in claim 4, characterized in that the applicator roller (66) is an anilox roller having a resilient transfer surface.

6. Inking/coating apparatus (10) as set forth in claim 1, characterized in that:

   a power actuator (104, 106) is movably coupled to the applicator head (60), the power actuator having a power transfer arm (104A, 106A) which is extendable and retractable; and,

   movement converting apparatus (108) is coupled to the power transfer arm for converting

extension or retraction movement of the power transfer arm into pivotal movement of the applicator head (60) relative to the carriage assembly.

7. Inking/coating apparatus (10) as set forth in claim 6, wherein the movement converting apparatus (108) is characterized by:

a bell crank plate (111) having a first end portion coupled to the power transfer arm and having a second end portion for engaging a stop member;
a stop member (119) secured to the applicator head (60); and,
a clevis plate (115) secured to the carriage assembly (58) and pivotally coupled to the bell crank plate.

8. Inking/coating apparatus (10) as set forth in claim 1, wherein the applicator head (60) is characterized by:

first and second side frame members (74, 76) pivotally coupled to the carriage assembly (58);
a doctor blade assembly mounted on the first and second side frame members, the doctor blade assembly including a reservoir (70) for receiving ink or liquid coating material;
a cradle assembly (78, 80), (82, 84) mounted on the first and second side frame members, respectively;
an applicator roller (66) mounted for rotation on the cradle assembly and coupled to the doctor blade assembly for rolling contact with ink or coating material in the reservoir, the applicator roller being engagable with a printing plate (P) on the plate cylinder (32) or with a blanket (B) on the blanket cylinder (34) when the applicator head (60) is in the operative position; and,
a drive motor (62) coupled to the applicator roller for rotating the applicator roller.

9. Inking/coating apparatus (10) as set forth in claim 8, characterized in that:

the cradle assembly (79, 80) has first and second sockets (79, 81) disposed on the first and second side frame members respectively; and,
the applicator roller (66) is mounted for rotation on the first and second sockets.

10. Inking/coating apparatus (10) as set forth in claim 8, characterized in that

the cradle assembly (78, 80), (82, 84) includes first and second sockets (79, 81) disposed on the first and second side frame members, respectively, and third and fourth sockets disposed on the first and second side frame members, respectively; and,
the applicator roller (66) is selectively mountable for rotation on either the first and second sockets or on the third and fourth sockets for applying ink or coating material to either the plate or blanket when the applicator head is in the operative position.

11. Inking/coating apparatus (10) as set forth in claim 1, wherein the applicator head (60) is characterized by:

a first cradle (78, 80) for supporting an applicator roller (66) for engagement with the plate when the inking/coating apparatus is in the operative position; and
a second cradle (82, 84) for supporting an applicator roller (66) for engagement with the blanket (B) when the inking/coating apparatus is in the operative position.

12. Inking/coating apparatus (10) as set forth in claim 1, wherein the carriage assembly is characterized by:

a support arm (88, 90) having a first end portion pivotally coupled to the printing unit (88A, 90A) and having a second end portion (88B, 90B);
a common pivot shaft (77) on which the support arm second end portion and the inking/coating apparatus are pivotally mounted; and,
male and female latch members (103, 105) coupled between the common pivot shaft and the printing unit, with one of the latch members being secured to the common pivot shaft and the other latch member being constructed for attachment onto the printing unit, the latch members being mateable in interlocking engagement when the applicator head (60) is in the operative position.

13. Inking/coating apparatus (10) as set forth in claim 1, wherein the applicator head (60) and the printing unit are characterized by:

male and female latch coupling members (103, 105) mounted on the carriage assembly (58) and on the printing unit for releasably latching the carriage assembly in interlocking engagement with the printing unit when the applicator head is in the operative position.

14. Inking/coating apparatus (10) as set forth in claim 1, wherein the carriage assembly (58) is characterized by an elongated shank portion (88B, 90B) and a hub portion (88A, 90A), the elongated shank portion being pivotally coupled to the applicator head

(60) and the hub portion being constructed for pivotal attachment onto the printing unit.

15. A rotary offset printing press (12) having first and second printing units (22, 24) and the inking/coating apparatus (10) of claim 1 is movably coupled to the first printing unit (22) as set forth in claim 1, characterized by:

a dryer (112) mounted on the first printing unit adjacent the impression cylinder (36) of the first printing unit for discharging heated air onto a freshly printed substrate while the freshly printed substrate is in contact with said impression cylinder.

16. A rotary offset printing press (12) as defined in claim 15, characterized in that:

an extractor (112E) is disposed adjacent the dryer for extracting hot air, moisture and volatiles from an exposure zone (Z) between the dryer and the freshly printed substrate.

17. A rotary offset printing press (12) as defined in claim 15, characterized in that:

an intermediate transfer cylinder (40) is coupled in sheet transfer relation with the impression cylinder (36) of the first printing unit (22); and,
an interstation dryer (114) is disposed adjacent the intermediate transfer cylinder for discharging heated air onto a freshly printed or coated substrate after it has been transferred from the impression cylinder of the first printing unit and while it is in contact with the intermediate transfer cylinder (40).

18. A method for rotary offset printing in a printing press (12) of the type including first and second rotary offset printing units (22, 24), and using aqueous or UV-curable printing ink or coating material in the operation of at least the first printing unit, characterized by the following steps performed at each printing unit in succession:

spot or overall coating a plate (P) with aqueous ink/aqueous coating material or UV-curable ink/UV-curable coating material;
spot and/or overall coating a blanket (B) with aqueous ink/aqueous coating material or UV-curable ink or UV-curable coating material;
transferring the printing ink or coating material from the printing plate (P) to the blanket (B);
transferring the inked or coated image from the blanket to a substrate (S) as the substrate is transferred through the nip between the impression cylinder (36) and the blanket (B); and,
drying the ink or coating material on the freshly printed substrate before the substrate is subsequently processed.

19. A method for rotary offset printing as defined in claim 18, wherein the drying step is characterized by:

discharging high velocity, heated air onto the freshly printed/coated substrate (S) while the freshly printed/coated substrate is in contact with the impression cylinder (36) of the first printing unit (22).

20. A method for rotary offset printing as defined in claim 18, characterized by the steps:

transferring the freshly printed substrate (S) from the first printing unit (22) to an intermediate transfer cylinder (40); and,
drying the freshly printed substrate while it is in contact with the intermediate transfer cylinder.

21. A method for rotary offset printing as defined in claim 18, characterized by the step:

extracting hot air, moisture and volatiles from an exposure zone (Z) above the freshly printed/coated substrate (S) while the freshly printed/coated substrate is in contact with the impression cylinder (36).

22. A method for rotary offset printing as defined in claim 18, characterized by the steps:

applying a primer coating of an aqueous coating material or UV-curable coating material to a substrate (S) in the first printing unit (22); and,
drying the primer coating on the substrate before the substrate is processed in the second printing unit.

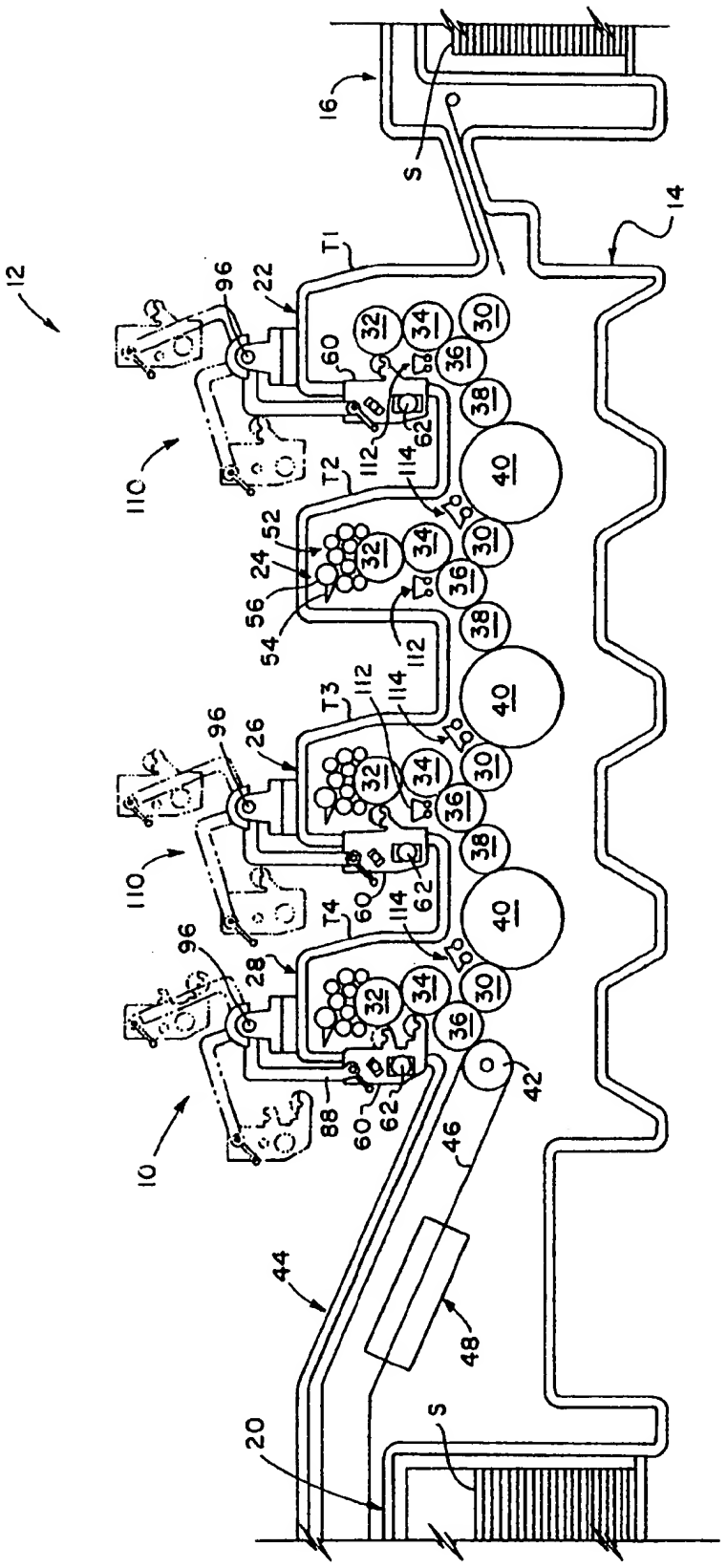
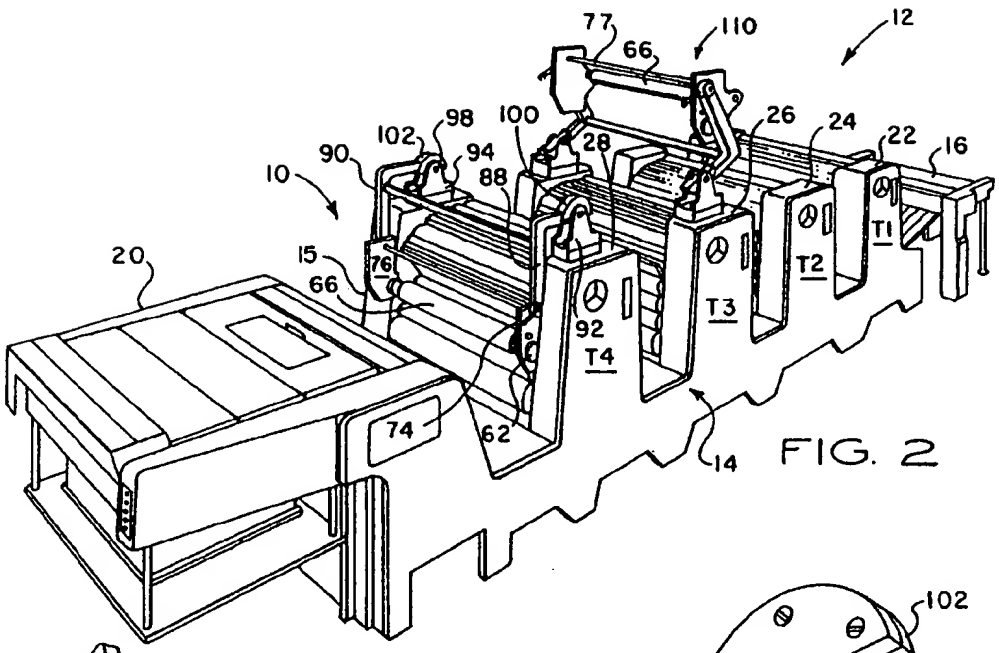


FIG. 1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94
88
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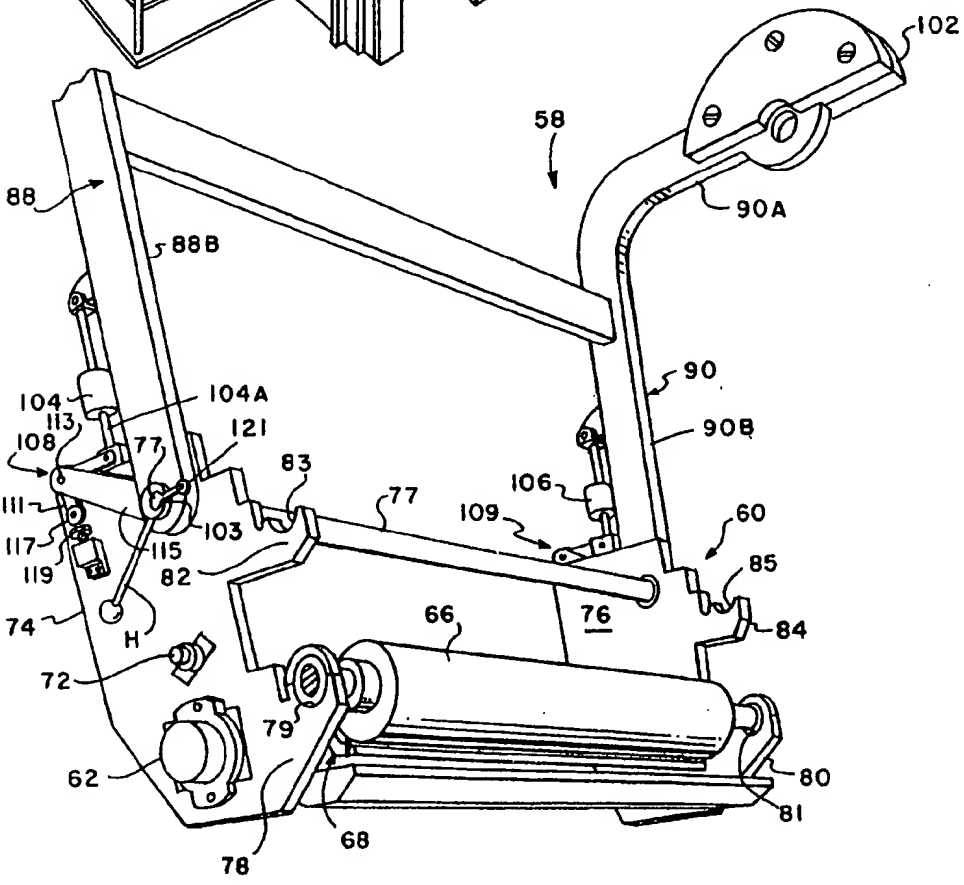
76
66
T1
T2
T3
92
T4
74
62
14

FIG. 2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88B
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103
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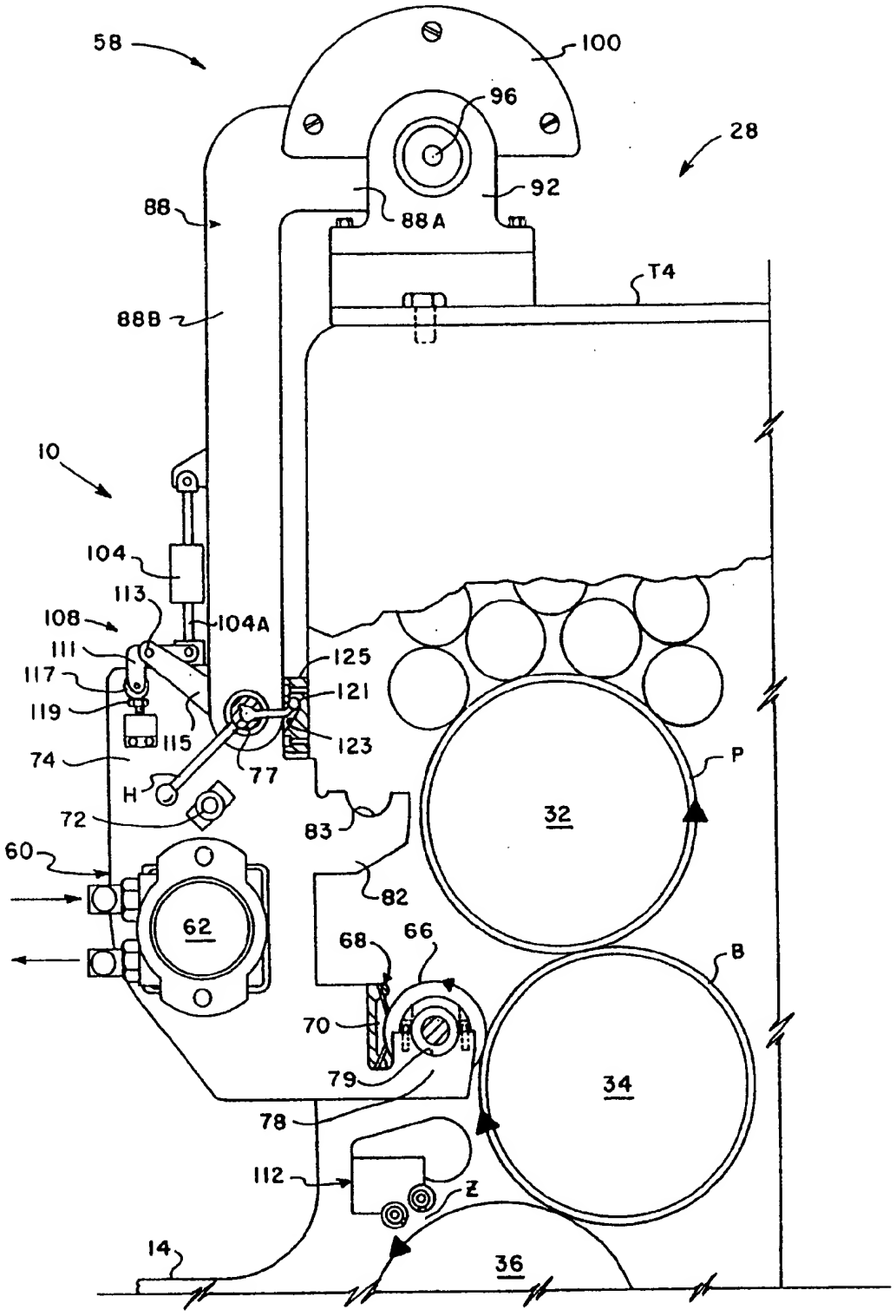
FIG. 3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123
74
77
P
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112
Z
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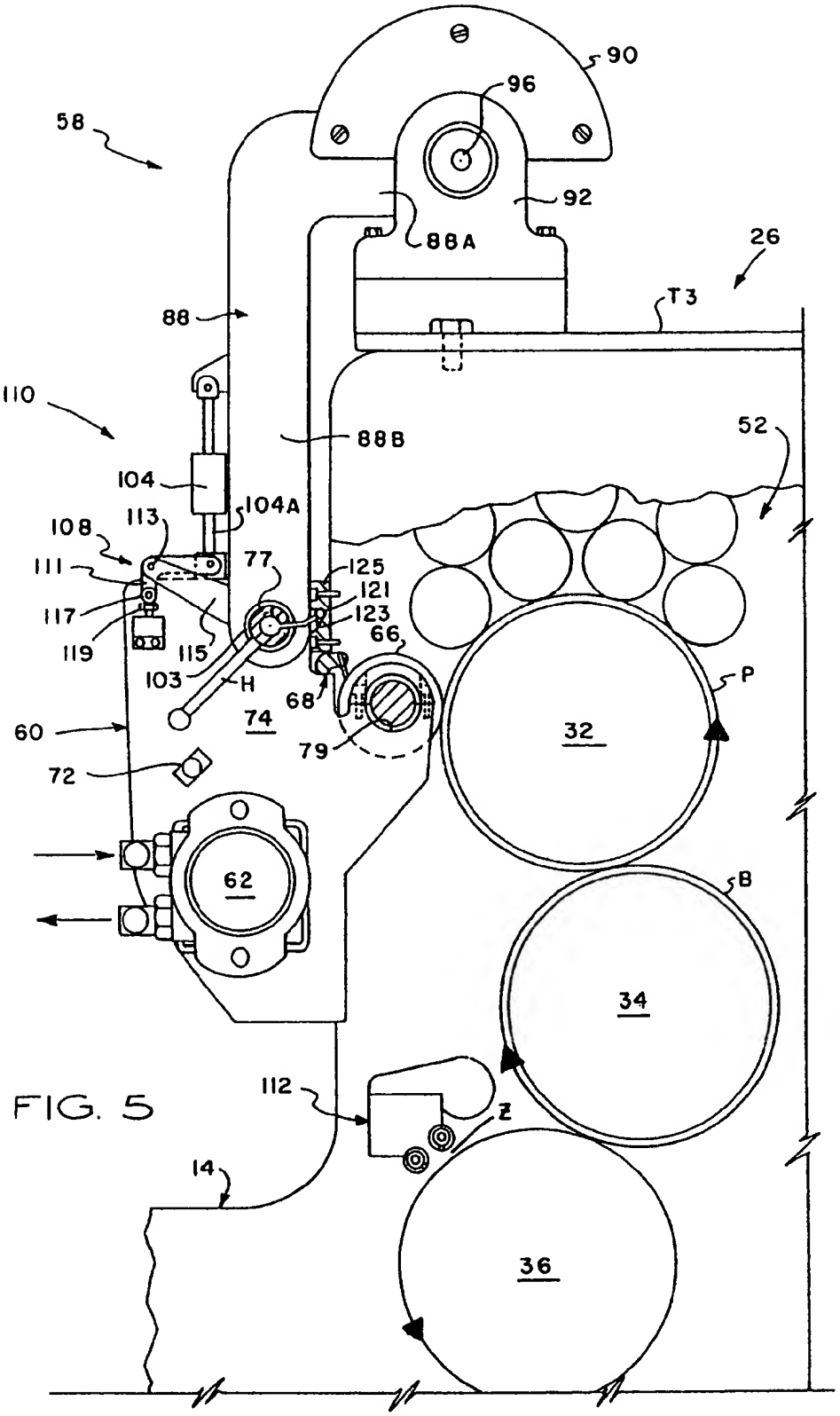
36

FIG. 4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123
117
66
119
115
103
H
68
74
79
60
72
P
32
62
B
34
112
Z
14
36

FIG. 5